

# PHILIPS



## 80 COLUMN LETTER QUALITY MATRIX PRINTER

NMS 1436/00

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INSTRUCTION MANUAL  
MANUEL D'INSTRUCTIONS  
INSTRUKTIONSHANDBUCH  
INSTRUKTIEBOEK  
MANUALE D'ISTRUZIONE  
MANUAL DE INSTRUCCIONES

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## CONTROL PANEL AND SWITCHES - ①

For drawings see enclosed folder.

### Ⓐ POWER ON INDICATOR

The green indicator lights up when the power is switched on.

### Ⓑ PAPER OUT INDICATOR

The red indicator lights up and an audible signal sounds when the printer detects that no paper has been inserted. The printer automatically enters the OFF-LINE state. To continue insert paper and press the ON-LINE key

### Ⓒ ON-LINE KEY AND INDICATOR

- When the green indicator lights up the printer is in the ON-LINE state.
- Press the ON-LINE button and the printer is in the OFF-LINE state.
- Press again to put printer in ON-LINE state again.

### Ⓓ L.Q. KEY AND INDICATOR (Letter Quality)

- (Can be activated only in the OFF-LINE state)
- When the green indicator lights up the printer is in letter quality mode.
  - Press the LQ-button for standard mode.
  - Press again for letter quality mode.

### Ⓔ F.F. KEY (Form Feed)

- (Can be activated only in the OFF-LINE state)
- When using single sheets, a sheet is automatically moved to the end of the page when you press the FF-button.

### Ⓕ L.F. KEY (Line Feed)

- (Can be activated only in the OFF-LINE state)
- Every time this key is pressed the paper is transported one line. If you keep the L.F. key depressed the paper will continue to be transported until you release the key again.

**Note:** These same keys are used for character pitch selection, as indicated on the control panel, immediately underneath the keys. For further details, see chapter "Character-pitch setting" on page 4.

### DIP SWITCHES

The DIP switches are located at the back of the machine. (See page 5 for further details.)

## INSTALLING AND USING YOUR PRINTER

**Make sure that both your computer and printer ② are turned off before connecting the printer!**

Connect the interface cable to the printer interface of your computer and your printer ③ and fasten the locking-clips.

Read these instructions carefully and follow them step by step when using your printer for the first time. Subjects like paper loading and installation of the ribbon cassette are particularly important. The same applies to the chapters on cautions for use and troubleshooting.

## INSTALLING AND REMOVING THE RIBBON CASSETTE - ④

**Note:** You will find a ribbon cassette packed with your printer. Additional cassettes are available through your dealer. (Type number SBC 436.)

### Installation

- a. Make sure that your printer is turned off first.
- b. Remove the printer cover ⑤.
- c. Remove the tractor unit ⑥.
- d. Move the print head ⑦ to the home position (to the extreme left).
- e. Turn the ribbon feed knob ⑧ in the direction of the arrow to remove possible slack from the ribbon.
- f. Insert the ribbon between the ribbon mask ⑨ (1) and the print head ⑨ (2) and position the cassette so that the feed shaft ⑩ is inserted into the hole under the ribbon feed knob.
- g. Press both ends of the cassette down firmly.
- h. Tighten the ribbon by turning the ribbon feed knob in the direction of the arrow and make sure the ribbon is still properly positioned in front of the print head.
- i. Close the printer cover again.

### Removal

Firmly hold the fin on top of the cassette ⑪ and pull it straight up.

## PAPER LOADING

### Single sheets

- a. Tractor unit has to be removed for single sheet operation ⑥.
- b. Mount paper shelf ⑫ by first placing it onto the special supports on the printer in upright position.
- c. Tilt up the paper shelf. Fold out the support ⑬ behind the paper shelf and place its end into the notch in the printer.
- d. Slide the left paper guide ⑭ into the proper position for your left margin.
- e. Set the right paper guide ⑮ simply by sliding it to the left or the right, as required.
- f. Put the power switch ② on. The green POWER ON indicator ① will light up.
- g. Place a sheet of paper on the paper shelf, between the paper guides.
- h. Pull the paper loading handle ⑯ towards you and the paper will automatically be transported to the proper starting position. (The printing will then start 1 inch from the top of the sheet.)
- i. Push the loading handle to the rear again and the paper bail ⑰ will set.
- j. Press the ON-LINE key and your printer is ready for action.

- Notes:**
1. If you want to shift a sheet of paper after it has been loaded, you can easily do so after completing the loading process as described above, since the paper is only held loosely by the friction mechanism. Make sure that the paper remains straight in the printer.
  2. If the left-hand paper guide has been set to its leftmost position, the left-hand margin of the printed sheet will be approx. 1 inch.



3. The two rollers of the paper bail should never be set to the outer edges of the paper but approx. One third of the width from the edges (18).

**Mounting the tractor unit  
(19) and inserting fan-fold  
paper**

- a. See to it that the power is turned off.
- b. Remove the printer cover (5) and the paper shelf (12).
- c. Pull the paper loading handle (20) towards you.  
Now you can install the paper feed tractor onto the platen:
- d. Insert the hooks on either side of the tractor unit into the openings at the front, on either side of the platen-unit (21).
- e. Push the rear of the tractor unit down so the spring loaded hooks (22) click into position.
- f. Open both tractor covers (23).
- g. Insert the paper into the printer loosely, as far as it will go (24).
- h. Turn your printer on.
- i. First push the paper loading handle to the rear, then pull it forward again and the paper will be transported automatically until it appears above the print head.
- j. Leave the paper loading handle in its front position! Turn the paper knob clockwise to transport the paper another 10 cm (4 inches).
- k. Then move the paper loading handle to its rear position.
- l. Adjust the tractors to correspond exactly with the width of the paper you are using.
- m. Carefully lay the paper over the tractors so the pins engage into the sprockets of the paper (25). Then close the tractor covers again.
- n. Now mount the paper shelf again and put it in horizontal position (26). (Fold the support flat against the paper shelf).
- o. Put the printer cover back onto the printer (5).
- p. Now transport the paper by turning the paper feed knob clockwise until the perforation of the second sheet appears above the print head.
- q. Finally press the ON-LINE key and your printer is ready for action.

**Note:** Make sure that your printer is set to the proper paper length!  
(See DIP-switch setting, page 5.)

## ADJUSTING THE PRINT HEAD - (27)

The print head can be adjusted with the print head adjustment lever (28). You will find it inside the printer on the right-hand side.  
When shipped from the factory, the lever is set at a position meant for straight printing without copy. If you want to print one or more copies, you can increase the force by moving the lever towards you.  
When printing single copies it is recommended to reset the lever to its original position to avoid unnecessary wear and tear on your printer.

## TEST FUNCTIONS

### Print self-testing

The printer self-testing facility offers you the opportunity to check the main functions of the printer.

- First insert a sheet of paper into the printer.
- Then turn the printer off.
- Turn the printer on again while you press the L.Q.-key.  
Keep the L.Q.-key depressed until printer starts its self-test.
- You can stop the printing by switching the printer off again.  
The self test prints all of the characters alternately in Draft character mode for five lines and LQ mode for five lines in a continuous pattern.

### Printing DIP switch setting.

If the LINE FEED switch is pressed during power-on, information on DIP SWITCH SETTING is printed.

### Hexadecimal dump

The hexadecimal dump facility is meant only to trace possible errors in your programs by providing a hexadecimal print-out of your work.

- First turn the printer off.
- Turn it on again while keeping the F.F.-key depressed.

Thereafter, 16 bytes of input data will be printed in a line at a time. If the amount of input data is less than 16 bytes and it is necessary to print them all, press the ON-LINE switch.

After the printing, press the ON-LINE switch to return to the dump function from the OFF-LINE state.

The Letter Quality Character mode can be set by pressing the LQ switch while in the OFF-LINE mode.

This function can be terminated in one of the following 2 ways:

1. Turn power off, wait 2 seconds, and then turn it back on again.
2. Input the INITIAL signal.

## CHARACTER PITCH SETTING FUNCTION

The character pitch can be set by operating the switches on the front panel of the printer. Follow the procedure described below.

1. While the printer is in the ON-LINE state, press the ON-LINE/SELECT switch and hold it down for more than 1 second. The ON-LINE lamp will start blinking on and off.
2. The character pitch is selected by pressing the LINE FEED/→ or FORM FEED/← switches while the ON-LINE lamp is blinking. The available character pitches are marked on the printer cover; the printer head moves to the position that corresponds to the selected character pitch.  
Press the LINE FEED/→ switch to move the printer head to the right, and press the FORM FEED/← switch to move the printer head to the left. The printer head moves in 10-column increments.



The position of the print head corresponds to character pitch as follows.

Column	Character pitch
0	Elite (12 cpi)
10	Pica (10 cpi)
20	Elite (12 cpi)
30	Condensed Pica
40	Condensed Elite (ignored in MSX mode)
50	Proportional

3. Press the LQ/SET switch to set the selected character pitch. The buzzer will sound, and the pinter will return to the ON-LINE state. (The ON-LINE lamp will stop blinking, and will remain steadily lit.)

If a character pitch other than "code setting" (column 0) is selected by the above procedure, character pitch setting commands will be ignored, no matter which operating mode is used.

## DIP SWITCH SETTING

The operating mode (MSX, IBM, EPSON, or PRESTEL), and various functions, can be selected by setting the DIP switches, located at the back of the printer (29). The DIP switches are read after the initialisation process. This process takes place when the power switch is set to ON, or when the INITIAL signal is input from the host computer.

When the printer is shipped from the factory, all switches are set to OFF. Make sure that the power is OFF when setting DIP switches. For more details, refer to page 42.

- Note 1:** Operating modes can be selected by setting DIP switches DSW 1-1 and 1-2.
- Note 2:** In EPSON and PRESTEL modes, the setting of DIP switch DSW 1-8 determines whether or not download characters are valid. If these characters are valid, the size of the communication buffer is reduced from 2.3K bytes to 0.7K bytes.
- In IBM mode, the communication buffer is always 2.3K bytes. In MSX mode, it is 8K bytes.

## CAUTIONS FOR USE

- Only use a power supply voltage within the specified range.
- Do not touch the print head immediately after printing because it can get very hot during operation.
- Be careful that you do not twist the ribbon while installing it.

- Wait at least two seconds after turning the power off before turning it back on again. If you don't the initialisation process may not be performed properly.
- Avoid direct sunlight, humidity and dust when using the printer.
- Do not perform printing when there is no ribbon and paper in your printer.
- Never install the tractor unit when you are using friction feed for cut sheet paper.
- When using continuous forms, the paper bail must be set to the platten side otherwise the paper may jam in the printer.
- Put the printer on a flat, firm table or desk, otherwise the plastic bottom enclosure may be deformed due to the heavy transformer in the printer.

## TROUBLESHOOTING

If your printer does not function properly, try and locate the cause, using the following checklist:

1. **The printer does not print and the POWER ON indicator does not light up.**  
There may be something wrong with the power supply. Check the power switch and the power cable connection.
2. **The printer does not print while the POWER ON indicator lights up.**  
First check whether the ribbon cassette has been installed properly. Try a printer self-test first. If the self-test works, check the connecting cable with the printer interface. If all that seems to be in order there may be something wrong with the computer program or the computer itself.
3. **The printer functions properly but the paper is not feeding through the way it should.**  
The paper is probably jammed in the printer.  
Remove the paper and insert it (or a new sheet) properly.
4. **The print is light or smeared.**
  - The print head adjustment is not correct.  
If so, set it properly according to the paper you are using.
  - The ribbon cassette has not been installed properly.
  - The ink ribbon is old and worn out.  
Replace the ribbon with a new one. (Type number SBC 436)  
You can use the printer self-test facility to check the quality of the ink ribbon.
5. **The PAPER OUT indicator blinks.**  
An error condition has been detected. Turn the power off and then back on again.



## BEDIENUNGSFELD UND SCHALTER - ①

Zeichnungen siehe beiliegendes Faltblatt.

**Ⓐ ANZEIGE  
"NETZSPANNUNG  
EIN"**

Die grüne LED-Anzeige leuchtet auf, wenn das Gerät eingeschaltet ist.

**Ⓑ ANZEIGE "PAPER  
OUT"**

Wenn der Drucker feststellt, dass kein Papier eingelegt worden ist, leuchtet die rote LED-Anzeige, und gleichzeitig ertönt ein akustisches Signal. Der Drucker geht dann automatisch in den Zustand OFF-LINE über. Zur Fortsetzung des Betriebes Papier laden und ON-LINE drücken.

**Ⓒ ON-LINE-TASTE UND  
ANZEIGE**

- Wenn die grüne LED-Anzeige leuchtet, befindet sich der Drucker im ON-LINE-Zustand.
- ON-LINE-Taste drücken: Drucker geht in den OFF-LINE-Zustand über.
- Taste nochmals drücken: Drucker kehrt wieder in den ON-LINE- Zustand zurück.

**Ⓓ LQ(LETTER  
QUALITY)-TASTE  
UND INDIKATOR**

- (Aktivierung nur im OFF-LINE-Zustand möglich).
- Wenn die grüne LED-Anzeige leuchtet, arbeitet der Drucker in der Betriebsart "Letter Quality".
  - Zum Übergang auf Normalbetrieb LQ-Taste drücken.
  - Für "Letter Quality"-Betrieb Taste nochmals drücken

**Ⓔ FF-TASTE(Form Feed =  
Papiervorschub)**

- (Aktivierung nur im OFF-LINE-Zustand möglich).
- Wird diese Taste bei Verwendung von Einzelblatt-Papier gedrückt, so erfolgt ein automatischer Transport bis zum Blattende (rote Anzeige PAPER OUT leuchtet auf).

**Ⓕ LF-TASTE (Line Feed =  
Zeilenvorschub)**

- (Aktivierung nur im OFF-LINE-Zustand möglich).
- Beim drücken dieser Taste wird das Papier jeweils um eine Zeile weitertransportiert. Wenn Sie die LF-Taste ständig gedrückt halten, wird das Paper solange transportiert, bis Sie die Taste wieder freigeben.

**Anmerkung:** Die gleichen Tasten werden für die Einstellung der Druckbreite verwendet, wie auf dem Bedienungsfeld unmittelbar unter den Tasten angegeben. Weitere Einzelheiten siehe unter "Einstellung der Druckbreite" auf Seite 11 .

**DIP-SCHALTER**

Die DIP-Schalter befinden sich an der Rückseite der Konsole. (Weitere Einzelheiten siehe Seite 11.)

## INSTALLATION UND GEBRAUCH IHRES DRUCKERS

Überzeugen sie sich davon, dass sowohl Ihr Computer als auch Ihr Drucker ② vor dem Anschluss des Druckers ausgeschaltet sind!  
Schliessen Sie das Schnittstellenkabel an die Drucker-Schnittstelle Ihres

Computers und an den Drucker ③ an und befestigen Sie die Arretierungsclips.

Lesen Sie die nachstehenden Anweisungen sorgfältig durch und befolgen Sie diese Punkt für Punkt beim erstmaligen Gebrauch Ihres Druckers.

Themen wie "Laden des Papiers" und "Einsetzen der Farbbandkassette" sind besonders wichtig. Das gleiche gilt für die Kapitel "Betriebshinweise" und "Fehlersuche".

## EINSETZEN UND ENTNAHME DER FARBBANDKASSETTE - ④

**Anmerkung:** Ihrem Drucker liegt eine Farbbandkassette bei. Ersatzkassetten beziehen Sie von Ihrem Händler (Typennummer SBC 436).

### Installation

- a. Überzeugen Sie sich davon, dass Ihr Drucker ausgeschaltet ist.
- b. Haube (Abdeckung) des Druckers abnehmen ⑤.
- c. Stiftwalzeneinheit ausbauen ⑥.
- d. Druckkopf ⑦ in die Endlage bringen (d.h. ganz nach links).
- e. Zum Spannen des Farbbandes den Bandtransportknopf ⑧ in Pfeilrichtung drehen.
- f. Farbband zwischen Bandmaske ⑨ (1) und Druckkopf ⑨ (2) einsetzen und Kassette so positionieren, dass die Transportwelle ⑩ in die Bohrung unter dem Bandtransportknopf eingreift.
- g. Kassette an beiden Seiten fest nach unten drücken.
- h. Farbband durch Drehen des Bandtransportknopfes in Pfeilrichtung spannen, und sicherstellen, dass Farbband immer noch vor dem Druckkopf positioniert ist.
- i. Druckerhaube wieder schliessen.

**Entnahme des Farbbandes** Die Rippe an der Oberseite der Kassette ⑪ erfassen und Kassette geradlinig nach oben ziehen.

## LADEN DES PAPIERS

### Einzelblätter

- a. Bei Verwendung von Einzelblättern, Stiftwalzeneinheit herausnehmen ⑥.
- b. Papierauflegeplatte ⑫ anbringen. Auflageplatte zunächst in Senkrechtlage auf die entsprechenden Haltenocken des Druckers setzen.
- c. Papierauflegeplatte anheben. Stütze ⑬ hinter der Papierauflege herausklappen und ihr Ende in den Schlitz im Drucker einsetzen.
- d. Linke Papierführung ⑭ bis zu dem von Ihnen gewünschten Rand schieben.
- e. Rechte Papierführung ⑮ einfach nach links oder rechts an die gewünschte Stelle schieben.
- f. Drucker mit Netzschalter ② einschalten. Die grüne LED "NETZSPANNUNG EIN" ① leuchtet auf.
- g. Ein Blatt Papier zwischen die Papierführungen auf die Papierauflege legen.



- h. Dann den Ladehebel (16) auf sich zuziehen: Papier wird automatisch in die richtige Startposition transportiert. (Das Bedrucken des Papiers beginnt dann im Abstand von 1" vom oberen Rand.)
- i. Ladehebel wieder nach hinten drücken. Damit ist der Papierstapel (17) richtig justiert.
- j. ON-LINE-Taste drücken, und Ihr Drucker ist betriebsbereit.

**Anmerkungen:**

- 1. Falls Sie ein Blatt Papier nach dem Laden verschieben möchten, so kann dies auf einfache Weise nach Beendigung des oben beschriebenen Ladevorgangs geschehen, da das Papier nur lose von der Zugwalze (friction mechanism) gehalten wird. Achten Sie darauf, dass das Papier glatt im Drucker bleibt.
- 2. Wenn die linke Papierführung ganz nach links gestellt ist, ergibt sich links auf dem bedruckten Blatt ein etwa 1" breiter Rand.
- 3. Die beiden Papierstapel-Andruckrollen sollten niemals an die Aussenkante des Papiers gesetzt werden, sondern jeweils um 1/3 der Blattbreite von den Kanten entfernt (18).

#### **Montage der Stiftwalzeneinheit (19) und Einsetzen des Endlospapiers**

- a. Überzeugen Sie sich davon, dass der Drucker ausgeschaltet ist.
- b. Druckerhaube (5) und Papierauflageplatte (12) abnehmen.
- c. Papierladehebel (20) auf sich zuziehen.  
Jetzt lässt sich die Stiftwalzeneinheit wie folgt auf der Druckwalze anbringen:
- d. Die Haken zu beiden Seiten der Stiftwalzeneinheit in die Öffnungen rechts und links an der Vorderseite der Druckwalzeneinheit (21) einsetzen.
- e. Rückseite der Stiftwalzeneinheit nach unten drücken, bis die federbelasteten Haken (22) einrasten.
- f. Beide Stiftwalzenabdeckungen (23) öffnen.
- g. Papier bis zum Anschlag lose in den Drucker einsetzen (24).
- h. Drucker einschalten.
- i. Erst den Papierladehebel nach hinten drücken und dann wieder nach vorne ziehen: Das Papier wird nun automatisch transportiert, bis es über dem Druckkopf erscheint.
- j. Papierladehebel in der vorderen Stellung belassen?
- k. Papierladehebel in die hintere Stellung bringen.
- l. Stiftwalzen so einstellen, dass sie genau der Breite des benutzten Papiers entsprechen.
- m. Papier sorgfältig über die Stiftwalzen legen, so dass die Stifte in die Perforation des Papiers (25) eingreifen. Dann Stiftwalzenabdeckung schliessen.
- n. Papierauflage montieren und in Horizontalstellung (26) bringen, nachdem Sie den Fuss an der Rückseite erst flach gegen die Auflage gedrückt haben.
- o. Druckerhaube wieder auf dem Drucker anbringen (5).
- p. Papier durch Drehen des Papiertransportknopfs im Uhrzeigersinne soweit transportieren, bis die Perforation des zweiten Blattes über dem Druckkopf erscheint.
- q. ON-LINE-Taste drücken, und Ihr Drucker ist betriebsbereit!

**Anmerkung:** Überzeugen Sie sich davon, dass Ihr Drucker auf die richtige Papierlänge eingestellt ist! (Siehe Papierlängeneinstellung mit DIP-Schalter, Seite 11.)

## JUSTIEREN DES DRUCKKOPFES - 27

Der Druckkopf kann mit dem Druckkopfjustierhebel 28 eingestellt werden. Dieser Hebel sitzt rechts im Inneren des Druckers.

In der Fabrik wird der Hebel justiert. Diese Stellung ist im Prinzip für normale Schreibarbeiten ohne Durchschläge geeignet. Wünschen Sie einen oder mehrere Durchschläge, so können Sie die Anschlagstärke durch Nachvornziehen des Hebels vergrößern.

Schreiben Sie ohne Durchschlag, so empfiehlt es sich, den Hebel wieder in seine ursprüngliche Stellung zu bringen, um unnötigen Verschleiss zu vermeiden.

## TESTFUNKTIONEN

### Drucker-Eigentest

Die Eigentestmöglichkeit gestattet Ihnen die Kontrolle der Hauptfunktionen des Druckers.

- Erst ein Blatt Papier in den Drucker einlegen.
- Dann Drucker ausschalten.
- Drucker wieder einschalten und dabei LQ-Taste drücken. Taste niedergedrückt halten, bis der Drucker den Eigentest startet.
- Stoppen des Druckvorgangs durch Ausschalten des Druckers.

Der Drucker druckt im Eigentest alle Schriftzeichen in fünf Zeilen in der "Draft Quality" und weiteren fünf Zeilen in "Letter Quality" kontinuierlich aus.

### Ausdrucken der DIP SWITCH Einstellung

Wird die Taste LINE FEED (Zeilenvorschub) bei eingeschaltetem Drucker gedrückt, so werden die Angaben über die DIP SWITCH SETTING (Einstellung der DIP-schalter) ausgedruckt.

### Hexadezimal-Speicherausdruck

Die Möglichkeit des Hexadezimal-Speicherausdrucks dient nur zum Aufspüren möglicher Fehler in ihren Programmen; denn sie liefert einen hexadezimalen Ausdruck ihrer Arbeit.

- Zuerst den Drucker ausschalten.
- Drucker wieder einschalten und gleichzeitig die FF-Taste in gedrückter Stellung festhalten.

Danach werden jeweils 16 Byte Eingabedaten in einer Zeile ausgedruckt. Wenn die Eingabedaten weniger als 16 Byte umfassen und alle ausgedruckt werden sollen, muss die ON-LINE-Taste gedrückt werden.

Nach dem Ausdruck zur Rückkehr auf die Speicherausdruckfunktion aus dem OFF-LINE-Status nochmals ON-LINE-Taste drücken. Die Schriftart "Letter Quality" kann durch Betätigung des LQ-Schalters, während sich das Gerät in der Betriebsart OFF-LINE befindet, eingestellt werden. Diese Funktion kann auf zwei verschiedene Arten beendet werden:

1. Netzschalter ausschalten, 2s lang warten und dann wieder einschalten.
2. Von der Parallel-Schnittstelle das Signal INITIAL eingeben.



## EINSTELLUNG DER DRUCKBREITE

Die Druckbreite kann mit den Schaltern im vorderen Bedienungsfeld des Druckers eingestellt werden, und zwar auf folgende Weise:

1. Während sich der Drucker im ON-LINE-Status befindet, ON-LINE/SELECT-Taste drücken und länger als 1 Sekunde in gedrückter Stellung festhalten. Die ON-LINE-Lampe beginnt zu blinken.
2. Die Druckbreite wird gewählt, indem man die LINE FEED/→ oder FORM FEED/← Taste drückt, während die ON-LINE-Lampe blinkt. Die verfügbaren Druckbreiten sind auf der Abdeckung des Druckers angegeben. Der Druckkopf bewegt sich in die Stellung, die der gewählten Druckbreite entspricht. LINE FEED/→ Taste drücken, wenn sich der Druckkopf nach rechts bewegen soll, und Taste FORM FEED/←, wenn sich der Druckkopf nach links bewegen soll. Der Druckkopf bewegt sich in 10-Spalten-Schritten.

Die Stellung des Druckkopfes entspricht folgendermassen den verschiedenen Druckbreiten:

Spalte	Druckbreite
0	Kodeeinstellung (Druckbreiteneinstellung nach Befehl)
10	Pica (10 cpi)
20	Elite (12 cpi)
30	Condensed Pica
40	Condensed Elite (wird bei MSX-Betrieb ignoriert)
50	Proportionalschrift

3. Zur Einstellung der gewählten Druckbreite Taste LQ/SET drücken. Der Summer ertönt, und der Drucker kehrt in den ON-LINE-Status zurück. (Die ON-LINE-Lampe hört auf zu blinken und leuchtet ständig.)

Wenn nach dem vorstehenden Verfahren eine andere Druckbreite als "code setting" (Spalte 0) gewählt wird, werden Druckbreiten-Einstellbefehle ignoriert, unabhängig davon, welche Betriebsart eingestellt ist.

## DIE EINSTELLUNG DER DIP-SCHALTER

Die Betriebsart (MSX, IBM, EPSON oder PRESTEL) und verschiedene Funktionen können mit den DIP-Schaltern an der Rückseite des Druckers (29) gewählt werden.

Die DIP-Schalter werden nach dem Initialisierungsprozess gelesen. Dieser Prozess findet statt, wenn der Netzschalter auf ON gestellt wird oder wenn das INITIAL-Signal vom Hauptcomputer eingeht.

Werksseitig werden alle Schalter vor dem Versand des Geräts auf OFF gestellt.

Achten Sie bei Einstellung der DIP-Schalter darauf, dass das Gerät auf OFF steht.

Weitere Angaben finden Sie auf der Seiten 42.

**Anmerkung 1:** Betriebsarten können nur mit dem DIP-Schaltern DSW 1-1 und DSW 1-2 gewählt werden. Es gibt keine Software-SteuerCodes für die Änderung der Betriebsart.

**Anmerkung 2:** Bei den Betriebsarten EPSON und PRESTEL bestimmt die Einstellung von DIP-Schalter DSW 1-8, ob frei definierte (download) Zeichen Gültigkeit haben. Wenn diese Zeichen gelten, verringert sich die Kapazität des Kommunikationspuffers von 2,3 KB auf 0,7 KB.  
In IBM-Betriebsart ist der Puffer immer 2,3 KB gross, in Betriebsart MSX hat er 8 KB Speicherkapazität.

## BETRIEBSHINWEISE

- Drucker nur an Netze mit dem spezifizierten Spannungsbereich anschliessen.
- Der Druckkopf kann im Betrieb sehr heiss werden, daher nicht unmittelbar nach dem Drucken berühren!
- Achten Sie darauf, dass sich das Farbband beim Einlegen nicht verdreht.
- Wiedereinschalten des Gerätes frühestens zwei Sekunden nach dem Ausschalten, da andernfalls das Initialisierungsverfahren nicht ordnungsgemäss abgewickelt werden kann.
- Drucker nicht bei direkter Sonneneinstrahlung oder bei Einwirkung von Feuchtigkeit und Staub betreiben.
- Drucker niemals ohne Farbband und ohne Papier betreiben.
- Niemals die Stiftwalzen einbauen, wenn Sie die Zugwalze (friction feed) für geschnittenes Einzelblattpapier benutzen.
- Bei Verwendung von Endlospapier muss der Papierstapel druckwalzen-seitig angelegt werden, - andernfalls ist mit einem Papierstau im Drucker zu rechnen.
- Stellen Sie den Drucker auf einen ebenen, soliden Tisch oder Schreibtisch, sonst kann die untere Kunststoffschale des Druckers durch das hohe Gewicht des Transformators im Drucker verformt werden.

## FEHLERSUCHE

Sollte der Drucker nicht ordnungsgemäss arbeiten, so können Sie versuchen, die Störung anhand nachstehender Prüfliste zu lokalisieren:

1. **Gerät druckt nicht, Anzeige "SPANNUNG EIN" leuchtet nicht.**  
Störung möglicherweise in der Stromversorgung.



**2. Gerät druckt nicht, Anzeige "SPANNUNG EIN" leuchtet.**

Erst prüfen, ob die Farbbandkassette ordnungsgemäss eingesetzt ist. Dann zunächst einen Drucker-Eigentest ausführen.

Ist der Eigentest einwandfrei verlaufen, Verbindungskabel zur Drucker-schnittstelle prüfen.

Scheint soweit alles in Ordnung, so kann das Computerprogramm oder der Computer selbst irgendeine Unregelmässigkeit aufweisen.

**3. Drucker arbeitet ordnungsgemäss, doch erfolgt kein einwandfreier Durchzug des Papiers.**

Papierstau im Drucker?

Gestautes Papier entfernen und ordnungsgemäss einlegen bzw. neues Blatt einlegen.

**4. Druck zu schwach oder verschmiert.**

- Falsche Justierung des Druckkopfes?

Wenn ja, Druckkopf in Abhängigkeit von dem benutzten Papier nachjustieren.

- Farbbandkassette nicht ordnungsgemäss eingelegt.
- Farbband alt und abgenutzt.

Farbband ersetzen. (Typennummer# SBC 436)

Die Qualität des Farbbandes kann mit dem Drucker-Eigentest überprüft werden.

**5. Anzeige PAPER OUT blinkt.**

Das Gerät hat einen Fehlerzustand entdeckt. Gerät ausschalten und wieder einschalten.

# PANNEAU DE COMMANDE ET INTERRUPTEURS -①

Pour les schémas voir la feuille pliée.

## ① VOYANT DE MISE SOUS TENSION

Le voyant vert s'allume lorsque l'imprimante est sous tension.

## ② INDICATEUR DE MANQUE DE PAPIER

Le voyant rouge s'allume et un signal sonore retentit lorsque l'imprimante détecte que le papier n'est pas introduit. Elle passe automatiquement en mode NON CONNECTE(OFF-LINE). Pour poursuivre l'impression, introduisez du papier et appuyez sur la touche de MODE CONNECTE (ON-LINE).

## ③ TOUCHE ET VOYANT <ON-LINE>

- Lorsque le voyant vert est allumé, l'imprimante est en mode CONNECTE.
- Appuyez sur la touche ON-LINE pour faire passer l'imprimante en mode NON-CONNECTE.
- Appuyez de nouveau pour faire passer l'imprimante en mode CONNECTE.

## ④ TOUCHE ET VOYANT L.Q.(Qualité courrier)

(Ne fonctionnent qu'en mode NON CONNECTE.)

- Lorsque le voyant vert est allumé, l'imprimante est en mode de qualité courrier.
- Appuyez sur la touche LQ pour obtenir le mode normal.
- Appuyez de nouveau sur cette touche pour passer en mode de qualité courrier.

## ⑤ TOUCHE F.F. (sortie de page)

(Ne fonctionne qu'en mode NON-CONNECTE)

En cas d'utilisation de feuilles séparées, appuyez sur la touche FF pour faire avancer automatiquement le papier jusqu'à la fin de la page. (Le voyant rouge PAPER OUT/MANQUE DE PAPIER s'allume.)

## ⑥ TOUCHE L.F. (Saut de ligne)

(Ne fonctionne qu'en mode NON CONNECTE)

Chaque fois que l'on appuie sur cette touche, le papier avance d'une ligne. Le transport du papier se poursuit tant que l'on maintient la touche L.F. enfoncée.

### Remarque:

Ces mêmes touches sont utilisées pour sélectionner l'espacement entre les lettres, comme l'indique le panneau de commande, juste au-dessous des touches. Pour plus de détails, voyez le chapitre «réglage caractères» en page 18.

## INTERRUPTEURS DIP

Les interrupteurs DIP sont situés à l'arrière de la console. (Voir page 19 pour de plus amples détails.)



# INSTALLATION ET UTILISATION DE VOTRE IMPRIMANTE

**Veillez à ce que l'ordinateur et l'imprimante ② soient tous deux hors tension avant de connecter l'imprimante!**

Raccordez le cordon d'interface à votre ordinateur et à l'imprimante ③ et fixez le à l'aide des clips de verrouillage.

Lisez attentivement les présentes instructions et suivez-les pas à pas lors de la première utilisation de votre imprimante. Certains points sont particulièrement importants, comme la mise en place de la cartouche à ruban et le chargement du papier. Il en est de même pour les chapitres relatifs aux précautions d'utilisation et au dépannage.

## MISE EN PLACE ET RETRAIT DE LA CARTOUCHE A RUBAN - ④

**Remarque:** Vous trouverez une cartouche à ruban dans l'emballage de votre imprimante. Vous pourrez obtenir des cartouches supplémentaires auprès de votre revendeur. (Numéro de type SBC 436.)

### Mise en place

- Vérifiez au préalable si votre imprimante est hors circuit.
- Retirez le capot de l'imprimante ⑤.
- Retirez le système à ergots ⑥.
- Amenez la tête d'impression ⑦ en position de départ (à l'extrême gauche).
- Tournez le bouton d'avancement du ruban ⑧ dans le sens de la flèche pour tendre éventuellement le ruban.
- Introduisez le ruban entre le masque du ruban ⑨ (1) et la tête d'impression ⑨ (2) et positionnez la cartouche de telle sorte que l'axe de transport ⑩ s'engage dans le trou ménagé sous le bouton d'avancement du ruban.
- Appuyez fermement sur les deux extrémités de la cartouche.
- Tendez le ruban en tournant le bouton d'avancement dans le sens de la flèche, et veillez à ce que le ruban soit correctement positionné devant la tête d'impression.
- Refermez le capot de l'imprimante.

### Retrait

Maintenez fermement l'aillette située au-dessus de la cartouche ⑪ et soulevez-la verticalement.

## CHARGEMENT DU PAPIER

### Feuilles simples

- Le système à ergots doit être retiré pour l'introduction feuille à feuille ⑥.
- Montez le support papier ⑫ et l'engageant tout d'abord dans les supports correspondants sur l'imprimante, en position verticale.

- c. Soulevez le support papier. Rabattez la languette (13) derrière le rayon en engageant l'extrémité dans l'encoche ménagée dans l'imprimante.
- d. Glissez le guide gauche (14) du papier (dans le sens de la flèche) pour le débloquer.
- e. Réglez le guide droit du papier (15) en le glissant simplement vers la droite ou la gauche, suivant le cas.
- f. Mettez l'interrupteur d'alimentation (2) en circuit. Le voyant vert (1) de mise sous tension (POWER ON) s'allume.
- g. Placez une feuille de papier sur le rayon du papier, entre les guides du papier.
- h. Tirez à vous le levier de chargement du papier (16) et le papier sera automatiquement transporté jusqu'à la position de départ correcte. (L'impression commencera alors à 2,5 cm du haut de la page.)
- i. Repoussez le levier en arrière pour régler le dispositif de maintien du papier (17).
- j. Appuyez sur la touche de mode connecté (ON-LINE) et votre imprimante est alors prête à travailler.

- Remarques:**
1. Si besoin est, vous pouvez aisément changer une feuille de papier une fois qu'elle a été chargée en effectuant l'opération de chargement précédemment décrite, car le papier n'est que légèrement maintenu par le mécanisme à friction. Veillez à ce que le papier reste droit dans l'imprimante.
  2. Si le guide du papier est placé en position d'extrême gauche, la marge de gauche de la page imprimée sera d'environ 2,5 cm.
  3. Les deux galets de maintien du papier ne doivent jamais être placés au niveau des bords du papier, mais doivent être éloignés de ces derniers d'un tiers environ de la largeur de la feuille (18).

#### Montage du système à ergots (19) et insertion de papier continu

- a. Veillez à ce que l'imprimante soit hors circuit.
- b. Retirez le capot de l'imprimante (5) et le support papier (12).
- c. Tirez à vous le levier de chargement du papier (20).  
Vous pouvez alors monter le système d'alimentation du papier à ergots sur son embase:
- d. Engagez les crochets, de part et d'autre du système à ergots, dans les orifices situés à l'avant, de part et d'autre de l'embase (21).
- e. Abaissez l'arrière du système à ergots de sorte que les crochets à ressort (22) s'enclenchent.
- f. Ouvrez les deux capots des ergots (23).
- g. Introduisez sans forcer le papier dans l'imprimante, jusqu'à ce qu'il arrive en butée (24).
- h. Mettez l'imprimante sous tension.
- i. Poussez tout d'abord vers l'arrière le levier de chargement du papier, puis ramenez-le vers l'avant. Le papier sera alors transporté automatiquement jusqu'à ce qu'il apparaisse au-dessus de la tête d'impression.
- j. Laissez le levier de chargement du papier en position avant! Tournez le bouton de chargement du papier dans le sens des aiguilles d'une montre pour faire avancer encore le papier de 10 cm.
- k. Amenez ensuite le levier de chargement du papier en position arrière.
- l. Ajustez les ergots pour qu'ils correspondent exactement à la largeur du papier que vous utilisez.



- m. Positionnez avec précaution le papier sur les ergots de sorte que ces derniers s'engagent dans les perforations du papier (25) , puis refermez les capots des ergots.
- n. Montez le support papier et placez le à l'horizontale (26) après avoir plaqué contre lui la languette situé à l'arrière.
- o. Remettez en place les capots sur l'imprimante (5).
- p. Faites ensuite avancer le papier en tournant le bouton dans le sens des aiguilles d'une montre, jusqu'à ce que la perforation de la deuxième feuille apparaisse au-dessus de la tête d'impression.
- q. Enfin, appuyez sur la touche ON-LINE. L'imprimante est alors prête à l'emploi.

**Remarque:** Veillez à ce que votre imprimante soit réglée sur la longueur de papier correcte! (Reportez-vous au réglage des interrupteurs DIP, page 19.)

## REGLAGE DE LA TÊTE D'IMPRESSION - (27)

Utilisez à cet effet le levier de réglage (28) de la tête d'impression. Il se trouve à l'intérieur de l'imprimante, sur la droite.

Le levier est réglé en usine. Cette position convient en principe pour une frappe normale sans double. Si vous désirez un ou plusieurs doubles, vous pouvez augmenter la force de frappe en tirant le levier vers l'avant.

Pour une frappe sans double, il est recommandé de ramener le levier dans sa position initiale pour éviter une usure superflue.

## FONCTIONS DE TEST

### Test automatique de l'imprimante

Le test automatique de l'imprimante vous permet de contrôler les principales fonctions de la machine.

- Introduisez tout d'abord une feuille de papier dans l'imprimante.
- Mettez ensuite l'imprimante hors tension.
- Remettez alors l'imprimante sous tension tout en maintenant la touche L.Q. enfoncée jusqu'à ce que l'imprimante passe en mode de test automatique.
- Vous pouvez arrêter l'imprimante en la remettant hors tension.

Le test automatique imprime tous les caractères alternativement toutes les cinq lignes en mode de qualité BROUILLON et en mode de qualité COURRIER (LQ), et ce en continu.

### Impression de la position des interrupteurs DIP

Si vous exercez une pression sur le commutateur LINE-FEED (d'interlignage), l'information concernant le réglage des interrupteurs DIP est imprimée.

## Vidage hexadécimal

La fonction de vidage hexadécimal ne permet que de dépister des erreurs éventuelles dans vos programmes en produisant un listing hexadécimal de votre travail.

- Mettez tout d'abord l'imprimante hors tension.
- Remettez-la sous tension en maintenant la touche F.F. enfoncée.

Ensuite, 16 octets de données sont imprimés en une fois sur une ligne. Si vous avez moins de 16 octets à imprimer, appuyez sur la touche ON-LINE. Après l'impression, appuyez sur la touche ON-LINE pour revenir à la fonction de vidage depuis le mode OFF. Le mode Qualité Courrier peut être activé en poussant sur l'interrupteur LQ alors que vous êtes en mode OFF-LINE.

Vous pouvez stopper cette fonction des deux manières suivantes:

1. Placez l'interrupteur POWER en position OFF, attendez 2 secondes, puis ramenez-le en position ON.
2. Envoyez le signal INITIAL.

## FONCTION DE RÉGLAGE DE L'ESPACEMENT ENTRE LES CARACTÈRES

Le pas, c'est à dire l'espacement entre les caractères, peut être réglé à l'aide des commutateurs figurant sur le panneau frontal de l'imprimante. Suivez à cet effet la procédure ci-après.

1. L'imprimante se trouvant dans le mode connecté (ON-LINE), appuyez sur la touche ON-LINE/SELECT et maintenez-la enfoncée pendant plus d'une seconde. Le voyant ON-LINE se met alors à clignoter.
2. La sélection du pas s'effectue par engagement de la touche LINE FEED/→ ou FORM FEED/← pendant que le voyant ON-LINE clignote. Les divers pas de caractères disponibles sont présentés sur le couvercle de l'imprimante. La tête d'impression se déplace vers la position qui correspond au pas de caractère sélectionné. Appuyez sur la touche LINE FEED/→ pour déplacer la tête vers la droite ou sur la touche FORM FEED/← pour la déplacer vers la gauche. La tête d'impression se déplace par tranches de 10 colonnes.

La position de la tête d'impression correspond au pas de caractère comme exposé ci-dessous:

Colonne	Pas du caractère
0	Réglage du code (le pas est établi par un ordre)
10	Pica (10 caractères par pouce)
20	Elite (12 caractères par pouce)
30	Pica condensé
40	Elite condensé (ignoré en mode MSX)
50	Proportionnel



3. Appuyez sur la touche LQ/SET pour régler le pas de caractère choisi. Le buzzer retentira et l'imprimante reviendra automatiquement en mode ON-LINE. (Le voyant ON-LINE cessera de clignoter, mais restera allumé en permanence).

Si un pas autre que "réglage du code" (colonne 0) est sélectionné par la procédure ci-dessus, les ordres de réglage du pas des caractères seront ignorés, quel que soit le mode de fonctionnement utilisé.

## RÉGLAGE DES INTERRUPTEURS DIP

Le mode de fonctionnement (MSX, IBM, EPSON ou PRESTEL) ainsi que diverses fonctions peuvent être sélectionnés au moyen des interrupteur DIP situés à l'arrière de l'imprimante (29).

La position de ces interrupteurs est relevée après le processus d'initialisation. Celui-ci a lieu lorsque l'interrupteur marche-arrêt est placé sur ON ou lorsque le signal INITIAL est reçu de l'ordinateur serveur.

A sa sortie de l'usine, tous les interrupteurs de l'imprimante sont en position OFF.

Assurez-vous que l'interrupteur marche-arrêt est sur OFF au moment de régler les interrupteurs DIP.

Pour de plus amples informations, voyez les pages 42.

**Remarque 1:** les modes de fonctionnement peuvent être sélectionnés uniquement par le réglage des interrupteurs DIP DSW 1 - 1 et 1 -2.

**Remarque 2:** Dans les modes EPSON et PRESTEL, le réglage de l'interrupteur DIP DSW 1 -8 détermine si oui ou non les caractères de charge (téléchargement) sont validés. Dans l'affirmative, la capacité de la mémoire tampon est ramenée de 2, 4 kOctets à 0,7 kOctets.

Dans le mode IBM, la mémoire tampon de communication est toujours de 2, 3 kOctets, alors qu'elle est de 8 kOctets dans le mode MSX.

## PRECAUTIONS D'UTILISATION

- Utilisez une tension d'alimentation conforme à la plage spécifiée.
- Ne touchez pas la tête d'impression immédiatement après l'impression car elle s'échauffe fortement pendant le fonctionnement.
- Veillez à ne pas vriller le ruban lors de sa mise en place.
- Après avoir arrêté l'imprimante, attendez au moins deux secondes avant de la remettre sous tension. Sinon, le processus d'initialisation risque d'être perturbé.
- Évitez d'utiliser l'imprimante sous un ensoleillement direct, à l'humidité et la poussière.
- Ne faites pas fonctionner l'imprimante sans ruban ni papier.

- N'installez jamais le système à ergots lors de l'utilisation de l'entraînement à friction pour les feuilles séparées.
- Lors de l'utilisation de papier accordéon, les galets de maintien du papier doivent être placés du côté des plaques, sinon le papier risque de se coincer dans l'imprimante.
- Placez l'imprimante sur une surface (table ou bureau) parfaitement à niveau et stable, sinon le coffret plastique peut se déformer cause du poids important du transformateur qui se trouve dans l'imprimante.

## DEPANNAGE

Si votre imprimante ne fonctionne pas correctement, essayez d'en localiser la cause, en utilisant la liste de vérifications ci-jointe:

**1. L'imprimante ne copie pas et le voyant de mise sous tension (POWER ON) ne s'allume pas.**

Il peut avoir un problème au niveau de l'alimentation.

Contrôlez l'interrupteur de mise sous tension et le branchement du cordon d'alimentation.

**2. L'imprimante ne copie pas alors que le voyant de mise sous tension (POWER ON) s'allume.**

Vérifiez tout d'abord si la cartouche à ruban est correctement installée. Essayez au préalable un test automatique de l'imprimante. Si le test fonctionne, contrôlez le cordon de raccordement à l'interface d'imprimante.

Si tout semble correct, le problème peut se situer au niveau du programme de l'ordinateur ou de l'ordinateur lui-même.

**3. L'imprimante fonctionne correctement mais le papier n'avance pas normalement.**

Le papier est probablement coincé dans l'imprimante. Retirez le papier et réengagez-le correctement (ou une nouvelle feuille).

**4. L'impression est terne ou présente des taches**

- Le réglage de la tête d'impression est incorrect: Dans ce cas, corrigez le réglage en fonction du papier que vous utilisez.
- La cartouche à ruban n'a pas été installée correctement.
- La cartouche à ruban est trop vieille ou usée.

Remplacez le ruban par un neuf. (Numéro de type SBC 436.)

Vous pouvez utiliser la fonction de test automatique de l'imprimante pour contrôler la qualité du ruban encreur.

**5. Le voyant de manque de papier (PAPER-OUT) clignote**

Une condition d'erreur a été détectée. Mettez l'imprimante hors tension, puis de nouveau sous tension.



## BEDIENINGSPANEEL EN SCHAKELAARS -①

Voor tekeningen zie bijgesloten vouwblad.

- Ⓐ **"POWER-ON" INDICATOR** Deze groene indicator licht op als de printer ingeschakeld is.
- Ⓑ **"PAPER OUT" INDICATOR** Deze rode indicator licht op (terwijl er een signaal klinkt) als de printer bepaalt dat er geen papier in de machine zit. De verbinding met de computer wordt dan automatisch verbroken en de "ON-LINE" indicator licht niet op. Om verder te kunnen gaan moet men eerst papier in de machine plaatsen en daarna op de "ON-LINE" toets drukken.
- Ⓒ **"ON-LINE" TOETS EN INDICATOR**
- Als de groene indicator oplicht is de printer in de "ON-LINE" stand.
  - Druk op de "ON-LINE" toets en de printer wordt omgeschakeld op de "OFF-LINE" stand.
  - Druk weer op dezelfde toets om terug te schakelen naar de "ON-LINE" stand.
- Ⓓ **"L.Q."-TOETS EN INDICATOR (Letter Quality)**
- (Deze toets kan alleen gebruikt worden als de printer op "OFF-LINE" staat)
- Als de groene indicator oplicht weet u dat de printer is ingesteld op "Letter Quality" (= Correspondentie kwaliteit).
  - Druk op de "L.Q."-toets en de printer staat weer op standaard-kwaliteit.
  - Druk nog eens en de "Letter Quality" stand is weer ingeschakeld.
- Ⓔ **"F.F."-TOETS (Form Feed)**
- (Deze toets kan alleen gebruikt worden als de printer op "OFF-LINE" staat). Bij gebruik van losse vellen wordt het papier automatisch tot het einde van het vel getransporteerd als u deze toets indrukt. (Daarna zal de "PAPER-OUT" indicator oplichten).
- Ⓕ **"L.F."-TOETS (Line Feed)**
- (Deze toets kan alleen gebruikt worden als de printer op "OFF-LINE" staat). Elke keer als u op deze toets drukt wordt het papier een regel verder getransporteerd. Houdt u de toets ingedrukt, dan blijft het papiertransport doorgaan.

**N.B.:** Dezelfde toetsen kunnen ook gebruikt worden voor het kiezen van de lettersoort, zoals aangegeven op het bedieningspaneel direct onder de toetsen. (Voor verdere bijzonderheden verwijzen wij u naar "Instellen van de letterbreedte" op pagina 25.)

### DIP-SCHAKELAARS

De DIP-schakelaars vindt u achter in het apparaat. (Zie pagina 25 voor nadere bijzonderheden.)

## INSTALLATIE EN GEBRUIK VAN DE PRINTER

**Let er vooral op, dat zowel uw computer als de printer ② zijn uitgeschakeld voordat u de printer aansluit!**

Sluit de interface-kabel aan op de printer-interface van uw computer en uw printer ③ en sluit daarbij de bevestigingsklemmetjes.

Lees deze aanwijzingen zorgvuldig en voer ze stap voor stap uit, vooral als u uw printer voor het eerst in gebruik neemt. Onderwerpen als het invoeren van het papier en aanbrengen van de lintcassette zijn vooral erg belangrijk. Hetzelfde geldt overigens ook voor de voorzorgsmaatregelen en het verhelpen van eventuele storingen.

## HET PLAATSEN EN VERWIJDEREN VAN DE LINT-CASSETTE -④

**N.B.:** Een lint-cassette is bij uw printer verpakt.  
Additionele cassettes zijn verkrijgbaar via uw dealer. (Het typenummer is SBC 436.)

### Het plaatsen

- a. Let er op, dat uw printer is uitgeschakeld.
- b. Verwijder de printerkap⑤.
- c. Verwijder het tractor-mechanisme⑥.
- d. Schuif de afdrukkop⑦naar zijn uitgangspositie, helemaal naar links.
- e. Draai de lint-transportknop⑧in de richting van de pijl, zodat hij goed strak komt te staan.
- f. Schuif het lint voorzichtig tussen het lintmasker⑨(1) en de afdrukkop⑨(2) en plaats de cassette zo in de printer, dat de aandrijfas⑩in de opening valt onder de lint-transportknop.
- g. Druk beide uiteinden van de cassette stevig naar beneden.
- h. Draai vervolgens het lint weer strak met de transportknop in de richting van de pijl. Let er op, dat het lint nog steeds goed voor de afdrukkop zit.
- i. Breng nu de printerkap weer aan.

### Verwijderen van de lint-cassette

Neem de opstaande vin op de cassette⑪stevig beet en trek hem recht omhoog.

## INVOEREN VAN HET PAPIER

### Losse vellen

- a. Bij gebruik van losse vellen moet het tractor-mechanisme worden verwijderd⑥.
- b. Breng het papier-plateau⑫aan door het eerst rechtopstaand op de speciale steunpunten van de printer te plaatsen.
- c. Klap het papier-plateau omhoog. Zet daarna het voetje⑬aan de achterzijde uit en plaats het uiteinde in de printer.
- d. Schuif de linker papiergeleider⑭in de juiste positie voor de gewenste linkerkantlijn.
- e. Stel de rechter papiergeleider⑮op de gewenste breedte door hem naar links of naar rechts te schuiven.
- f. Schakel de netvoeding in met de aan/uit schakelaar②. De groene "POWER ON" indicator①licht nu op.
- g. Plaats een vel papier op het papier-plateau tussen beide papiergeleiders.



- h. Trek de papier-invoer handle (16) naar u toe en het papier wordt automatisch naar de goede start-positie getransporteerd. Bij het afdrukken van de tekst zal die dan een inch ( $\pm 2,5$  cm) van de bovenzijde van het papier beginnen.
- i. Duw de papier-invoer handle weer naar achteren en de aandrukrollen (17) worden op het papier geplaatst.
- j. Druk nu op de ON-LINE toets en uw printer is klaar om zijn werk te beginnen.

- Attentie:**
- 1. Wilt u een vel papier verschuiven nadat het is ingevoerd, dan kan dat heel eenvoudig nadat u de bovenomschreven handelingen verricht hebt, aangezien het papier bij de z.g. "frictie-voeding" niet stevig vastgeklemd wordt. Zorg er wel voor, dat het papier recht in de printer blijft.
  - 2. Als u de linker papiergeleider in de meest linkse positie geplaatst hebt is de linker kantlijn in principe ongeveer 1 inch ( $\pm 2,5$  cm).
  - 3. De twee aandrukrollen moeten nooit op de uitersten van het papier geplaatst worden maar op ongeveer een derde van de breedte verwijderd van de buitenkanten (18).

**Aanbrengen van het tractor-mechanisme (19) en het inbrengen van ketting-papier**

- a. Let er op, dat uw printer is uitgeschakeld!
- b. Verwijder de printerkap (5) en het papier-plateau (12).
- c. Trek de papier-invoer handle (20) naar u toe.  
Nu kunt u de tractor-unit monteren:
- d. Plaats de haken aan beide uiteinden van de unit in de uitsparingen (21) aan beide zijden van de rolhouder van de printer.
- e. Druk de achterzijde van de unit stevig naar beneden totdat de verende klemhaken (22) vastklikken.
- f. Open beide tractor-kleppen (23).
- g. Plaats het papier voorzichtig in de printer totdat u weerstand voelt (24).
- h. Schakel de printer nu aan.
- i. Duw de papiertransport-handle eerst naar achteren om hem daarna weer naar voren te trekken. Het papier wordt automatisch in de printer gevoerd tot de voorste rand boven de afdrukkop verschijnt.
- j. Laat de papiertransport-handle in de voorste positie staan! Transporteer het papier ongeveer 10 cm verder door de transportknop rechtsom te draaien.
- k. Duw de papiertransport-handle weer naar achteren.
- l. Verschuif de tractors zo, dat ze precies zijn afgesteld op de breedte van het papier.
- m. Leg het papier zorgvuldig zo op de tractors, dat de pennen aan beide zijden in de perforaties van het papier (25) vallen en sluit de tractor-kleppen weer.
- n. Monteer het papier-plateau en breng hem in horizontale positie (26) nadat u het voetje aan de achterzijde eerst vlak tegen het plateau gedrukt hebt.
- o. Plaats de printerkap op het apparaat (5).
- p. Draai de transportknop rechtsom totdat de perforatie tussen het eerste en tweede vel boven de afdrukkop verschijnt.
- q. Druk tenslotte op de "ON-LINE" toets en uw printer is klaar voor gebruik.

**N.B.:** Zorg ervoor, dat de printer goed is afgesteld op de lengte van het papier dat u gebruikt! (Zie "Instellen DIP-Schakelaars", pagina 25.)

## AFSTELLEN VAN DE AFDRUKKOP - 27

De afdrukkop kan worden afgesteld met de afstelhefboom 28 . U vindt hem in de printer, aan de rechterzijde.

Als de printer de fabriek verlaat is de hefboom zo afgesteld, dat de printer geschikt is voor normaal tikwerk zonder doorslagen. Wilt u een of enkele doorslagen, dan kunt u de kracht van de aanslag vergroten door de hefboom naar voren te trekken.

Tikt u zonder doorslag dan verdient het aanbeveling de hefboom weer op zijn oorspronkelijke stand te zetten om onnodige slijtage te voorkomen.

## TEST FUNCTIES

### Zelf-test van de printer

Uw printer heeft de mogelijkheden om zijn belangrijkste functies te testen:

- Plaats eerst een vel papier in de printer.
- Schakel de printer vervolgens uit.
- Druk de "L.Q."-toets in en houd die ingedrukt als u de printer weer aanschakelt, tot de zelf-test begint.
- U kunt het afdrukken van de tekens weer stoppen door de printer uit te schakelen.

Nu worden alle tekens in een doorlopend proces, afwisselend in vijf regels standaardkwaliteit in vijf regels LQ kwaliteit afgedrukt.

### Afdrukken instelling DIP schakelaars

Als de LINE FEED toets wordt ingedrukt als de printer is ingeschakeld, dan wordt informatie over het instellen van de DIP schakelaars afgedrukt.

### Hexadecimale dump

De hexadecimale dump mogelijkheid dient uitsluitend om hexadecimale afdrukken van uw programma's te maken, die behulpzaam kunnen zijn bij het opsporen van fouten in uw programma's.

- Schakel de printer eerst uit.
- Schakel hem vervolgens weer aan, terwijl u de FF toets ingedrukt houdt.

Daarna worden steeds 16 bytes invoergegevens tegelijk in een regel afgedrukt. Omvatten die gegevens minder dan 16 bytes en is het nodig ze alle af te drukken, druk dan op de ON-LINE toets. Als de afdruk gereed is, moet u op de ON-LINE toets drukken om terug te keren naar de dumpfunctie vanuit de OFF-LINE stand. De LQ stand kunt u instellen door op de LQ toets te drukken, terwijl de printer in de OFF-LINE stand staat.

Deze functie kan op de volgende twee manieren beëindigd worden:

1. Schakel de printer uit, wacht twee seconden en zet hem daarna weer aan.
2. Voer het INITIAL signaal in.



## HET INSTELLEN VAN DE LETTERSOORT

De lettersoort kan worden ingesteld met behulp van de schakelaars op het frontpaneel van de printer. Volg hiervoor onderstaande procedure.

1. Terwijl de printer ON-LINE staat, drukt u de ON-LINE/SELECT toets in en houdt u deze gedurende meer dan 1 seconde ingedrukt. Het ON-LINE indicatorlampje gaat knipperen.
2. De lettersoort wordt geselecteerd door de LINE FEED/→ of FORM FEED/← toets in te drukken, terwijl het ON-LINE indicatorlampje staat te knipperen. De beschikbare lettersoorten staan aangegeven op de transparante kap van de printer. De afdrukkop gaat naar de positie die overeenkomt met de geselecteerde lettersoort. Door LINE FEED/→ in te drukken verplaatst de afdrukkop zich naar rechts; door FORM FEED/← in te drukken verplaatst de afdrukkop zich naar links. De afdrukkop verplaatst zich in stappen van 10 kolommen.  
De positie van de afdrukkop korrespondeert als volgt met de lettersoort.

Kolom	Lettersoort
0	Code-instelling (lettersoort-instelling m.b.v. commando)
10	Pica (10 cpi)
20	Elite (12 cpi)
30	Condensed Pica
40	Condensed Elite (niet in MSX-mode)
50	Proportioneel

3. Druk op LQ/SET om de geselecteerde lettersoort in te stellen. Op dit moment weerklinkt de zoemer en keert de printer terug in de ON-LINE status. (Het ON-LINE indicatorlampje stopt met knipperen en gaat weer gewoon branden.)

Indien er een andere lettersoort instelling dan "code-instelling" (kolom 0) is geselecteerd in bovenstaande procedure, worden lettersoort instelling-commando's genegeerd, ongeacht welke modus wordt gebruikt.

## HET INSTELLEN VAN DE DIP-SCHAKELAARS

De modus (MSX, IBM, EPSON of PRESTEL) en de verschillende functies kunnen geselecteerd worden door instellen van de DIP-schakelaars, achter op de printer (29). De instelling van de DIP-schakelaars wordt afgelezen na het initialisatieproces. Dit proces vindt plaats wanneer de AAN/UIT schakelaar op ON wordt gezet of wanneer het INITIAL signaal binnenkomt uit de HOST computer.

Wanneer de printer de fabriek verlaat, staan alle DIP-schakelaars op OFF. Denk eraan dat bij het instellen van de DIP-schakelaars de AAN/UIT schakelaar van de printer op OFF moet staan.

Zie voor meer informatie pagina 42.

**Opmerking 1:** De modi worden uitsluitend geselecteerd m.b.v. DIP-schakelaars 1-1 en 1-2.

**Opmerking 2:** In de EPSON en PRESTEL modi bepaalt de instelling van DIP-schakelaar 1-8 of download-tekens geldig zijn of niet. Indien deze tekens geldig zijn, wordt de omvang van de communicatiebuffer teruggebracht van 2,3 K bytes naar 0,7 K bytes.

In de IBM modus is de omvang van de communicatiebuffer altijd 2,3 K bytes. In de MSX is dit 8 K bytes.

## VOORZORGSMATREGELEN

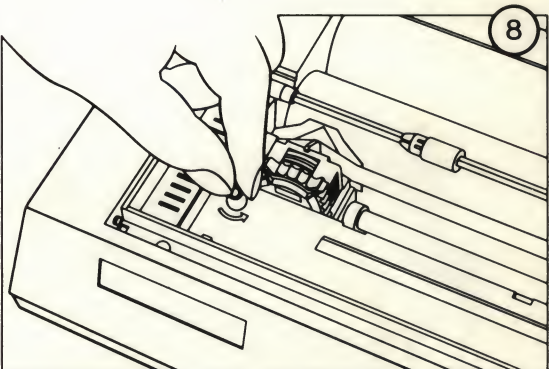
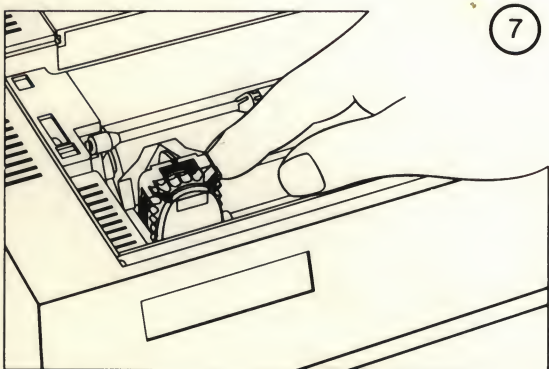
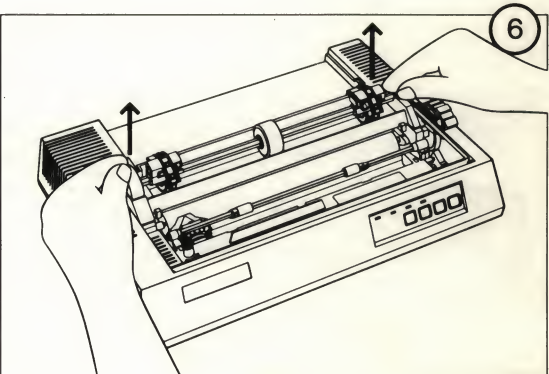
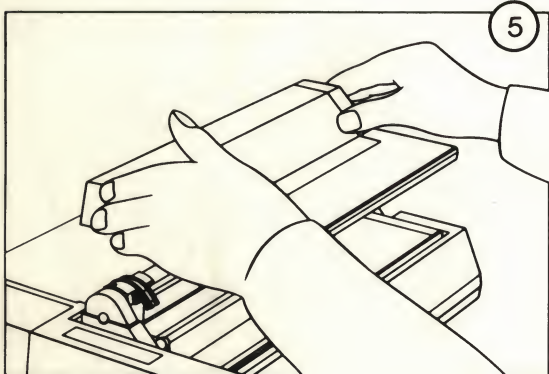
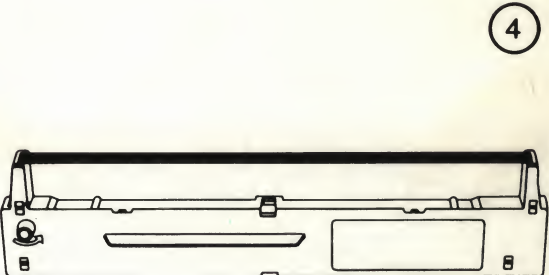
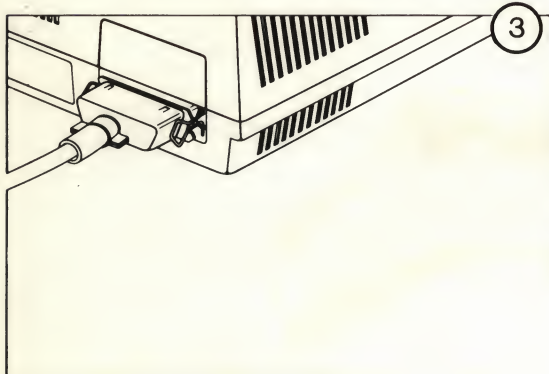
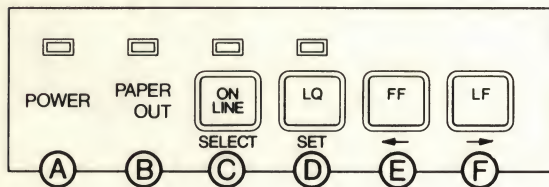
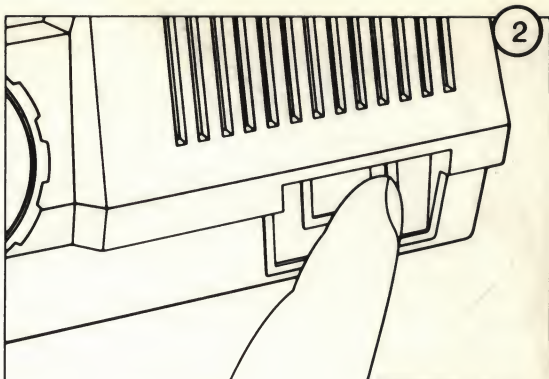
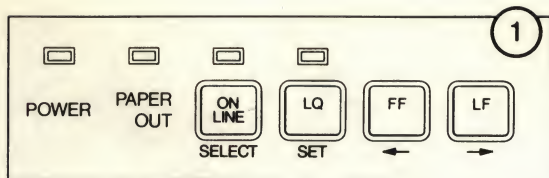
- Gebruik nooit een andere dan de voorgeschreven netvoeding.
- Raak de afdrukkop niet direct aan na het afdrukken van een tekst, aangezien hij erg heet kan worden.
- Let erop, dat het lint niet verdraaid raakt als u de cassette in de printer plaatst.
- Wacht tenminste twee seconden nadat u de printer uitgeschakeld hebt voordat u hem weer aanzet. Doet u dat niet, dan bestaat de kans dat het opstartproces niet goed verloopt.
- Plaats uw printer niet in direct zonlicht en vermijd vocht en stof als u de printer gebruikt.
- Laat de printer nooit werken als er geen lint in de machine zit.
- Plaats het tractor-mechanisme nooit op de printer als u losse vellen en frictie-voeding gebruikt.
- Als u kettingpaper gebruikt moeten de aandrukrollen op het papier rusten. Doet u dat niet, dan hebt u kans dat het papier in de printer vastloopt.
- Plaats de printer op een vlakke, stevige tafel of bureau, anders kan het gebeuren dat de bodemafluiting deformeert door de zware transformator in de printer.

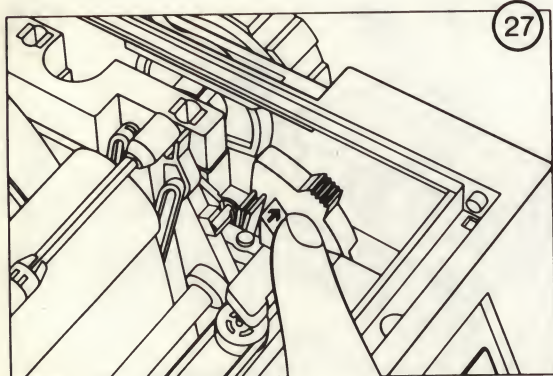
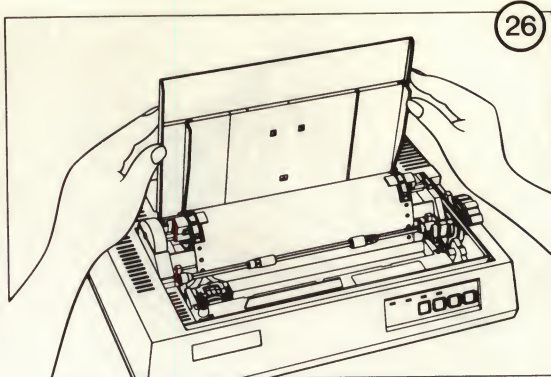
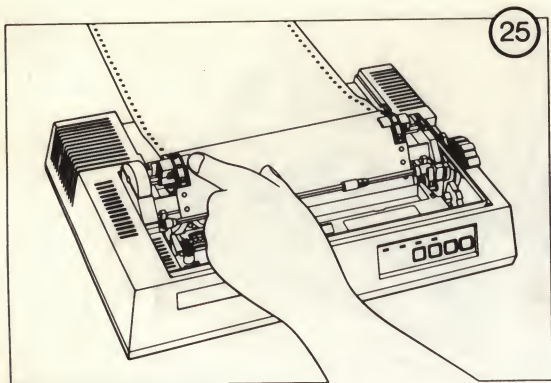
## VERHELPEM VAN STORINGEN

Als uw printer niet goed functioneert, probeer dan met behulp van dit overzicht de oorzaak op te sporen en te verhelpen:

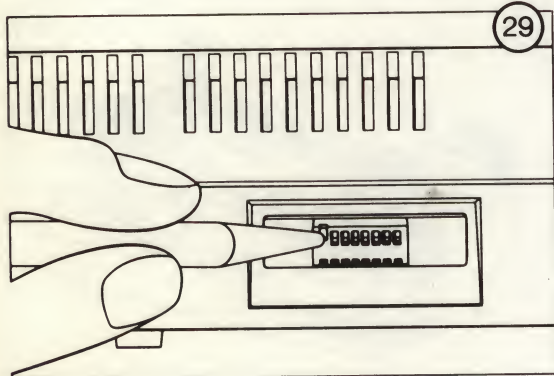
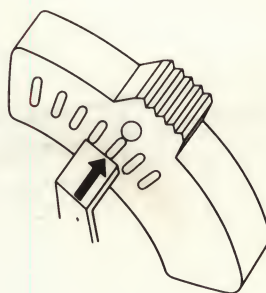
1. **De printer werkt niet terwijl de "POWER-ON" indicator niet oplicht.**  
Misschien is er iets mis met de netvoeding. Kijk of de hoofdschakelaar goed staat en de steker goed in het stopcontact zit.
2. **De printer drukt niet af terwijl de "POWER-ON" indicator wel oplicht.**  
Kijk eerst of het lint goed is aangebracht. Probeer dan een zelf-test van de printer. Verloopt die goed, kijk dan of de interface-kabel goed is aangesloten. Blijkt dat in orde te zijn dan is er misschien iets mis met het computer-programma.







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3. **De printer functioneert goed maar het papiertransport werkt niet optimaal.**

De kans bestaat, dat het papier is vastgelopen.

Verwijder het papier en voer dan een nieuw vel in de machine.

4. **De afdruk is erg licht of vertoont vegen.**

- Misschien is de afdrukkop niet goed ingesteld. Stel hem dan goed af, overeenkomstig het papier dat u gebruikt.

- Misschien is de lint-cassette niet goed in de printer geplaatst.

- Het lint kan oud en versleten zijn.

Vervang hem dan door een nieuwe. (Typenummer SBC 436.)

Gebruik de zelf-test functie om de kwaliteit van het lint uit te proberen.

5. **De "PAPER-OUT" indicator knippert.**

Er is een fout geconstateerd. Schakel de printer uit, wacht 2 seconden en schakel hem vervolgens weer aan.

## PANNELLO DI CONTROLLO E BOTTONERIA - ①

Per i piani vedi depliant allegato.

- Ⓐ INDICATORE DI ALIMENTAZIONE** L'indicatore color verde si accende quando la corrente di alimentazione è innesca.
- Ⓑ INDICATORE DI FINE-CARTA** L'indicatore color rosso si accende mentre un segnale acustico viene prodotto quando il detettore della stampante stabilisce che non è stata inserita la carta. In tal caso la stampante inserisce automaticamente la condizione di OFF-LINE.
- Ⓒ INDICATORE E CHIAVE DI MESSA IN LINEA**
- Quando si accende la luce verde, allora la stampante si trova in linea.
  - Premendo il bottone ON-LINE, allora la stampante si trova in condizione di OFF-LINE.
  - Premendo nuovamente sullo stesso bottone, allora la stampante si viene a trovare nuovamente in linea.
- Ⓓ INDICATORE E CHIAVE PER CARATTERI DI QUALITÀ**
- (Può essere attivato solo in condizione di OFF-LINE)
- Quando l'indicatore verde è acceso, allora la stampante si trova nello stato di caratteri di qualità.
  - Per ottenere lo stato normale, premere il pulsante LQ.
  - Premere nuovamente lo stesso pulsante per ottenere lo stato di caratteri di qualità.
- Ⓔ PULSANTE F.F. (Form Feed)**
- (Può essere attivato solo in condizione di stato OFF-LINE).
- Usando dei fogli singoli, il foglio verrà trasportato automaticamente fino in fondo del foglio premendo il pulsante F.F. la luce rossa di segnalazione per mancanza di carta si accenderà.
- Ⓕ PULSANTE L.F. (Line Feed)**
- (Può essere attivato solo in condizione di stato OFF-LINE).
- Ogni volta che viene pressato questo pulsante, la carta viene trasportata di una riga. Tenendo premuto questo pulsante di LINE FEED, allora la carta viene trasportata continuamente fino a che non viene lasciato il pulsante stesso.
- Nota:** Questi stessi pulsanti vengono usati anche per la selezione del passo carattere, come indicato sul pannello di controllo, immediatamente sotto ai pulsanti. Per ulteriori dettagli, vedere il capitolo "Regolazione del passo carattere" a pagina 32.
- MICRO-INTERRUTTORI** I MICRO interruttori sono collocati sul retro del pannello. (Vedere pagina 33 per ulteriori informazioni.)



# INSTALLAZIONE ED USO DELLA STAMPANTE

**Assicurarsi prima di tutto che sia il computer che la stampante ② siano spenti, prima di collegare la stampante!**

Collegare il cavo di interfaccia all'interfaccia stampante del computer e della stampante ③ e fissarlo tramite le mollette di sicurezza.

Leggere attentamente le presenti istruzioni passo per passo nell'uso della stampante per la prima volta. Oggetti come l'inserzione della carta e l'installazione della cassetta con nastro sono particolarmente importanti. Lo stesso vale per i capitoli relativi agli avvertimenti per l'uso ed i suggerimenti in caso di funzionamento difettoso.

## INSTALLAZIONE E RIMOZIONE DELLA CASSETTA DEL NASTRO - ④

**Nota:** Insieme alla stampante viene consegnata una cassetta per il nastro. Ulteriori cassette possono essere acquistate presso i distributori. (Numero del tipo: SBC 436.)

### Installazione

- a. Assicurarsi prima di tutto che la stampante sia spenta.
- b. Rimuovere la copertura della stampante ⑤.
- c. Togliere l'unità di trasporto ⑥.
- d. Spostare la testa della stampante ⑦ sulla estrema posizione a sinistra.
- e. Girare il bottone-guida del nastro ⑧ in direzione della freccia per rimuovere possibili residui dal nastro.
- f. Inserire il nastro tra la maschera del nastro ⑨ (1) e la testa della stampante ⑨ (2) e collocare la cassetta in modo tale che l'asse di guida ⑩ venga a trovarsi nell'incavatura al di sotto del bottone-guida del nastro.
- g. Premere bene ad ambedue i lati della cassetta verso il basso.
- h. Tendere il nastro girando il bottone-guida in direzione della freccia ed assicurarsi che il nastro si trovi in posizione giusta davanti alla testa del cursore della stampante.
- i. Richiudere la copertura della stampante.

### Rimozione

Tenere la panna al di sopra della cassetta ⑪ con fermezza ed estrarre in giù.

## INSERIZIONE DELLA CARTA

### Foglio singolo

- a. Con l'uso di fogli sciolti l'unità di trasporto deve essere tolta ⑥.
- b. Montare la guida-carta ⑫ alla prima inserzione sugli speciali appoggi della stampante in posizione verticale.
- c. Sollevare la carta-guida. Ripiegare l'appoggio ⑬ dietro alla carta-guida e collocare il suo terminale nell'intaccatura della stampante.

- d. Spostare il lato sinistro della guida (14) nella giusta posizione corrispondente al Vostro margine sinistro.
- e. Collocare il lato destro della guida (15) semplicemente facendola scivolare verso destra o verso sinistra, a seconda della necessità.
- f. Innescare l'interruttore dell'alimentazione (2). L'indicatore a luce verde (1) si accende (POWER ON).
- g. Collocare un foglio di carta nell'appoggia-carta tra le due relative guide.
- h. Tirare la levetta (16) per l'inserzione di carta in avanti verso di Voi ed il foglio verrà automaticamente trasportato sulla posizione giusta per l'inizio della stampa. (La stampa inizierà ad 1 pollice dal margine superiore del foglio.)
- i. Spingere nuovamente la levetta di inserzione all'indietro per assicurare così (17) il foglio.
- j. Premere il pulsante ON-LINE e la stampante è pronta per entrare in funzione.

- Annotazioni:**
1. Se desiderate spostare il foglio di carta dopo che esso è stato inserito, lo potete fare dopo aver svolto la procedura di inserzione come descritto sopra, considerato che il foglio di carta viene tenuto leggermente fermo per mezzo di un meccanismo a frizione. Assicurarsi che il foglio di carta rimanga verticale nella stampante.
  2. Se la guida a sinistra si trova sulla posizione estrema del lato sinistro, allora la stampa avrà inizio a circa un pollice dal margine sinistro del foglio.
  3. I due rulli del fermo del foglio di carta non devono essere mai disposti al di fuori del foglio stesso, ma devono trovarsi a circa un terzo della larghezza del foglio dai margini del foglio stesso (18).

**Montaggio dell'unità di trasporto (19) e l'introduzione della carta perforata**

- a. Fare attenzione che l'alimentazione sia disinnescata
- b. Rimuovere la copertura della stampante (5) e l'appoggio carta (12).
- c. Tirare la levetta di inserzione carta (20) in avanti verso di Voi.  
A questo punto può essere apportato il trasportatore per carta forata sul rullo:
- d. Inserire i ganci ad ambedue i lati del trasportatore nelle aperture situate sul frontale, su ciascun lato del rullo (21).
- e. Premere il lato posteriore del trasportatore in basso di modo che i ganci (22) sotto la forza della molla vengano a trovarsi incastrati nella giusta posizione.
- f. Aprire ambedue le coperture della stampante (23).
- g. Inserire la carta nella stampante senza usare pressione e fino al punto che è possibile (24).
- h. Accendere la stampante.
- i. Prima di tutto premere la levetta per inserzione carta all'indietro, poi tirarla di nuovo in avanti e la carta verrà trasportata automaticamente fino a che non apparirà al di sopra del cursore stampante.
- j. Lasciare la levetta nella sua posizione avanzata!  
Girare la manopola del trasporto carta in senso orario per trasportare la carta per altri 10 centimetri (4 pollici).
- k. Infine spingere la levetta per inserzione carta sulla sua posizione arretrata.
- l. Regolare la posizione dei trasportatori per farli corrispondere esattamente con la larghezza della carta che viene usata.
- m. Far passare con accortezza la carta sui trasportatori in modo che le penne vengano a trovarsi nei fori della carta (25). Infine chiudere nuovamente la copertura del trasportatore.



- n. Montare il piatto della carta e portarlo in posizione orizzontale ②⑥ dopo che il supporto posteriore è stato ripiegato contro il piatto stesso.
- o. Riporre nuovamente la copertura sulla stampante ⑤.
- p. Trasportare ora la carta girando in senso orario la manopola dal trasportatore della carta fino a che la perforazione del secondo foglio non appaia sopra il cursore stampante.
- q. Infine premere il bottone ON-LINE e la stampante è pronta per entrare in azione.

**Nota:** Assicurarsi che la stampante sia regolata per la corrispondente lunghezza della carta! (Vedere la regolazione dei microinterruttori, pagina 33.)

## ASSESTAMENTO DEL CURSORE DI STAMPA - ②⑦

Il cursore di stampa può essere messo a punto per mezzo della levetta di regolazione 28 . Questa si trova all'interno della stampante sul lato destro. In fabbrica viene regolata la leva. La posizione è normalmente adatta per la stampa normale senza copie dupliche. Se si desidera avere dei duplicati, uno o due, allora si ha la possibilità di aumentare la forza della battuta tirando in avanti la leva.

Se non si desidera ottenere delle copie, si consiglia di portare la leva sulla sua posizione originaria per evitare inutile logorio.

## FUNZIONI TEST

### Auto-test della stampante

La possibilità di auto-test della stampante Vi offre la possibilità di controllare le funzioni principali della stampante.

- Insire prima di tutto un foglio di carta nella stampante
- Togliere la corrente.
- Inserire la corrente nuovamente mentre si preme il pulsante L.Q. Mantenere il pulsante L.Q. premuto fino a che la stampante inizi la procedura di auto-test.
- Potete interrompere la procedura di auto-test togliendo semplicemente la corrente.

L'auto-test stampa tutti i caratteri alternando cinque righe in modo carattere di bozza con cinque righe in modo LQ, in maniera continua.

### Disposizione del micro-interruttore di stampa

Quasando il pulsante LINE FEED é depresso mentre la stampante é accesa, vengono stampate informazioni relative alla DISPOSIZIONE DEL MICROINTERRUTTORE.

### Immissione in esadecimale

L'immissione in esadecimale serve solo a rintracciare possibili errori presenti nei vostri programmi tramite un listato stampato in esadecimale del vostro lavoro.

- Anzitutto, spegnere la stampante.
- Riaccenderla mantenendo il pulsante F.F. depresso.

In seguito, verranno stampati 16 bytes di dati di input per riga e per volta. Qualora la quantità di dati di input sia inferiore a 16 bytes e qualora sia necessario stamparli tutti, premere il pulsante ON-LINE.

A stampa ultimata, premere il pulsante ON-LINE per tornare alla funzione d'immissione ed uscire dallo stato OFF-LINE. Il modo Carattere Letter Quality può essere impostato premendo il pulsante LQ mentre si è in modo OFF-LINE.

Si può porre fine a questa funzione in 2 modi:

1. Spegnerne la stampante, aspettare 2 secondi, e riaccendere la stampante.
2. Immettere il segnal INITIAL dall'interfaccia parallela.

## FUNZIONE DI REGOLAZIONE DEL PASSO CARATTERE

Il passo carattere può essere regolato tramite i pulsanti sul pannello frontale della stampante. Seguire la procedura descritta qui di seguito.

1. Mentre la stampante si trova in condizione ON-LINE, premere il pulsanti ON-LINE/SELECT e mantenerlo depresso per oltre 1 secondo. La spia ON-LINE inizierà a lampeggiare.
2. Per selezionare il passo carattere, premere i pulsanti LINE FEED/→ o FORM FEED/← mentre la spia lampeggia. I passi carattere disponibili sono indicati sul coperchio della stampante; la testa della stampante si sposta sulla posizione corrispondente al passo carattere selezionato. Premere il pulsante LINE FEED/→ per spostare la testa della stampante verso destra, e premere il pulsante FORM FEED/← per spostare la testa della stampante verso sinistra. La testa della stampante si sposta con passi di 10 colonne.

La posizione della testa della stampante corrisponde ai seguenti passi carattere:

Colonna	Passo carattere
0	Impostazione codics (passo impostato tramite comando)
10	Pica (10 cpi)
20	Elite (12 cpi)
30	Pica condensato
40	Elite condensato (ignorato in modo MSX)
50	Proporzionale

3. Premere il pulsante LQ/SET onde impostare il passo carattere. A questo momento si udirà un segnale acustico e la stampante tornerà alla condizione ON-LINE. (La spia ON-LINE smette di lampeggiare e rimane accesa.)

Qualora sia selezionato, tramite la procedura sumenzionata, un passo carattere diverso da quello "impostazione codice" (colonna 0), i comandi di regolazione del passo carattere saranno ignorati, qualunque sia il modo operativo selezionato.



## REGOLAZIONE DEL MICROINTERRUTTORE

I modi operativi (MSX, IBM, EPSON o PRESTEL), nonché varie funzioni, possono essere selezionati tramite la regolazione dei microinterruttori collocati sul retro della stampante (29). I microinterruttori vengono letti dopo il processo di inizializzazione. Questo processo avviene quando l'interruttore si trova in posizione ON, o quando viene immesso un segnale INITIAL dal computer.

Per il trasporto, tutti i microinterruttori sono in posizione OFF.

Assicurarsi che la stampante sia spenta (OFF) prima di regolare i microinterruttori.

Per ulteriori particolari, vedere a pp 42.

**Nota 1:** I modi operativi possono essere selezionati solo regolando i microinterruttori DSW 1 - 1 e 1 - 2.

**Nota 2:** Nei modi EPSON e PRESTEL, la regolazione del microinterruttore DSW 1 - 8 determina la validità o meno dei caratteri caricati. Se questi caratteri sono validi, il buffer di comunicazione passa da 2,3K bytes a 0,7K bytes. In modo IBM, il buffer di comunicazione è sempre di 2,3K bytes. In modo MSX, il buffer è di 8K bytes.

## PRECAUZIONI PER L'USO

- Usare solo voltaggio di alimentazione entro i limiti espressamente specificati.
- Non toccare il cursore stampante immediatamente dopo le operazioni di stampa perchè esso può essere molto caldo subito dopo il funzionamento.
- Fare attenzione di non apportare pieghe nel nastro durante le operazioni di montaggio.
- Attendere per almeno due secondi dopo aver tolto la corrente prima di innescarla di nuovo. Tralasciando questo tempo di attesa, allora il processo di inizializzazione non può aver luogo nella maniera adatta.
- Evitare diretti raggi solari, umidità e polvere nei pressi della stampante durante il periodo di funzionamento.
- Non far eseguire lavori di stampa quando non sono presenti carta e nastro.
- Non installare mai l'unità trattrice quando si usa la frizione di trasporto per tagliare i fogli di carta.
- Quando si usa formulari di carta continui, la sicura della carta deve essere collocata sul lato piatto altrimenti la carta viene ad impigliarsi nella stampante.
- Mettere la stampante su un tavolo od una scrivania piana e stabile, altrimenti il coperchio inferiore in plastica si potrebbe deformare dall'eccessivo peso del trasformatore nella stampante.

## CONSIGLI IN CASO DI FUNZIONAMENTO DIFETTOSO

Se la Vostra stampante non dovesse funzionare come si deve, provare a cercare da sè il motivo, usando la seguente lista di controllo:

**1. La stampante non stampa e la luce verde dell'alimentazione non si accende**

In questo caso c'è qualche cosa che non funziona nel sistema di alimentazione. Controllare l'interruttore ed i cavi dell'alimentazione.

**2. La stampante non stampa mentre la luce verde dell'alimentazione è accesa.**

Prima di tutto controllare se la cassetta del nastro è stata montata nella stampante in modo corretto. Provare per primo l'auto-test della stampante. Se l'auto-test funziona, controllare il cavo di collegamento con l'interfaccia della stampante. Se non si ottiene alcun risultato, allora controllare se ce qualche cosa che non è corretta nel Vostro programma oppure nel computer stesso.

**3. La stampante funziona come si deve però la carta non viene trasportata nella maniera .**

Probabilmente la carta si è impigliata nella stampante. Rimuovere la carta ed inserirla (oppure un solo foglio) in modo corretto.

**4. Lo stampato è troppo chiaro oppure sporco.**

- Il cursore stampante non è regolato come lo deve essere: in tal caso regolarlo in modo giusto secondo il tipo di carta che viene usata.
- La cassetta del nastro non è stata montata in maniera corretta.
- Il nastro stesso è vecchio e consumato.

Sostituire il nastro con uno nuovo (tipo nr. SBC 436).

Si può anche far uso dell'auto-test allo scopo di esaminare la qualità del nastro.

**5. La luce del „PAPER OUT” lampeggia**

Una situazione errata è stata trovata. Togliere la corrente ed innescarla di nuovo.



## PANEL DE CONTROL Y CONMUTADORES -①

Para los dibujos véase la hoja plegada adjunta.

### Ⓐ INDICADOR DE ENCENDIDO

El indicador verde se ilumina cuando se conecta la tensión.

### Ⓑ INDICADOR DE FALTA DEL PAPEL

El indicador verde se ilumina y suena una señal audible cuando la impresora detecta que no ha sido insertado el papel. La impresora automáticamente se pone al estado de OFF-LINE (fuera de línea).

Para continuar insertar el papel y pulsar la tecla ON-LINE (en línea).

### Ⓒ TECLA E INDICADOR ON-LINE (en línea)

- Cuando el indicador verde está iluminado la impresora está en el estado ON-LINE (en línea).
- Pulsar la tecla ON-LINE y la impresora se pone en el estado de OFF-LINE (fuera de línea).
- Pulsar de nuevo para poner otra vez la impresora en el estado ON-LINE.

### Ⓓ TECLA E INDICADOR L.Q. (Calidad de Letra)

- (Sólo puede ser activado en el estado de OFF-LINE (fuera de línea).)
- Cuando el indicador verde se ilumina la impresora está en el modo calidad de letra.
  - Pulsar el botón L.Q. para modo normalizado.
  - Pulsar de nuevo para el modo calidad de letra.

### Ⓔ TECLA F.F. (alimentación de formularios)

(Puede ser activado sólo en el estado de OFF-LINE). Cuando use hojas únicas, una hoja es transportada automáticamente hasta el final de la página cuando presione el botón F.F.  
(El indicador rojo PAPER OUT (falta de papel) estará iluminado).

### Ⓕ TECLA L.F. (avance de línea)

(Puede ser activado sólo en el estado de OFF-LINE).  
Cada vez que se presiona esta tecla el papel es transportado una línea. Si mantiene la tecla L.F. presionada el papel continuará siendo transportado hasta que suelte de nuevo la tecla.

**Nota:** Estas mismas teclas son usadas para la selección de distanciamiento entre caracteres, como se indica directamente debajo de las teclas sobre el panel de control. Para más detalles véase el capítulo "Ajuste de Distanciamiento entre Caracteres" en la página 39.

### INTERRUPTORES BASCULANTES

Los interruptores basculantes (DIP) se encuentran en la parte posterior de la consola. (para más detalles véase la página 40.)

## INSTALACION Y USO DE SU IMPRESORA

¡Asegúrese de que ambos ordenador e impresora ② están desconectados de la tensión antes de conectar la impresora!

Conéctese el cable al enchufe de la impresora y del ordenador ③ y apriete los resortes de sujeción.

Léase estas instrucciones detenidamente y sígalas paso por paso cuando use su impresora por primera vez.

Asuntos como la carga del papel e instalación de la cassette de cinta son particularmente importantes. Lo mismo se aplica a los capítulos sobre precauciones para el uso y localización de fallos.

## INSTALACION Y RETIRADO DE LA CASSETTE DE CINTA -④

**Nota:** Encontrará una cassette de cinta empaquetada con su impresora. Cassettes adicionales son disponibles vía sus concesionarios. (Número de tipo SBC 436.)

### Instalación

- Primero asegúrese que su impresora está desconectada de la tensión.
- Retirar la cubierta de la impresora ⑤.
- Retirar la unidad tractor ⑥.
- Mover la cabeza impresora ⑦ a la posición inicial (completamente a la izquierda).
- Girar la rueda de alimentación de cinta ⑧ en la dirección de la flecha para quitar la posible flojedad de la cinta.
- Insertar la cinta entre el dispositivo protector de la cinta ⑨ (1) y la cabeza impresora ⑨ (2) y posicione la cassette de forma que el eje de alimentación ⑩ se inserte en el agujero debajo de la rueda de alimentación de la cinta.
- Presione firmemente hacia abajo ambos extremos de la cassette.
- Tensar la cinta girando la rueda de alimentación de la cinta en la dirección de la flecha y asegúrese que la cinta todavía está posicionada debidamente enfrente de la cabeza impresora.
- Cerrar de nuevo la cubierta de la impresora.

### Retirado

Coger firmemente la guía sobre la cassette ⑪ y tirar hacia arriba.

## CARGA DEL PAPEL

### Hojas sueltas

- Al usar hojas sueltas se debe retirar la unidad tractor ⑥.
- Móntese la bandeja portapapel ⑫ colocándola primero en posición vertical sobre los soportes especiales en la impresora.
- Inclínese la bandeja portapapel hacia arriba. Doblar completamente el soporte ⑬ detrás de la bandeja portapapel y colocar su extremo dentro de la ranura en la impresora.
- Deslizar la guía de papel izquierda ⑭ en la posición correcta para su margen izquierdo.
- Colocar la guía de papel derecha ⑮ deslizándola simplemente a izquierda o derecha, como se requiera.
- Pulsar el interruptor de red ②. Se iluminará el indicador verde POWER ON ①.



- g. Colocar una hoja de papel en la bandeja portapapel, entre las guías de papel.
- h. Girar de la palanca de carga del papel (16) hacia sí mismo y el papel será transportado automáticamente a la posición de listo correcta. (La impresión comenzará entonces a 1 pulgada desde arriba de la hoja.)
- i. Empujar la palanca de carga hacia atrás de nuevo y la varilla sujetapapel (17) se ajustará.
- j. Presionar la tecla ON-LINE y su impresora está lista para el funcionamiento.

- Notas:**
- 1. Si desea cambiar una hoja de papel después que ha sido cargada, lo puede hacer fácilmente después del proceso de carga completo como es descrito arriba, ya que el papel está sólo retenido sin presión por el mecanismo de fricción. Asegúrese que el papel permanece derecho en la impresora.
  - 2. Si la guía de papel de la mano izquierda ha sido puesta en la posición completamente a izquierdas, el margen izquierdo de impresión de la hoja será de 1 pulgada aprox.
  - 3. Los dos rollos pisapapel de la varilla sujetapapel nunca deben ser puestos en los extremos del papel, sino aproximadamente a un tercio del ancho de los bordes (18).

### Montaje de la unidad tractor (19) y la inserción del papel continuo

- a. Compruebe si la tensión de alimentación está desconectada.
- b. Retirar la cubierta de la impresora (5) y la bandeja portapapel (12).
- c. Tírese la palanca de carga del papel (20) hacia sí mismo.  
Ahora puede usted instalar el tractor alimentador de papel sobre los rodillos.
- d. Insertar los enganches en cada lado de la unidad tractor en las aberturas en la parte frontal, a cada lado de la unidad de rodillo (21).
- e. Empujar la parte posterior del tractor hacia abajo de forma que los enganches con resorte (22) entren con un clic a su posición.
- f. Abrir ambas cubiertas del tractor (23).
- g. Insertar el papel dentro de la impresora flojamente, hasta donde sea posible (24).
- h. Encienda su impresora.
- i. Primero empujar la palanca de carga del papel hacia atrás, después tirar de nuevo hacia delante y el papel será transportado automáticamente hasta que aparece por encima de la cabeza impresora.
- j. ¡ Dejar la palanca de carga del papel en su posición frontal!  
Gírese la rueda de alimentación del dirección del reloj para transportar el papel otros 10 cm (4 pulgadas).
- k. Después mover la palanca de carga del papel a su posición posterior.
- l. Ajústense los tractores para corresponder exactamente con el ancho del papel que se esté usando.
- m. Colocar el papel cuidadosamente sobre los tractores para que los pasadores encajen en las perforaciones del papel (25). Entonces cerrar las cubiertas del tractor nuevo.
- n. Montar la bandeja portapapel y poner en posición horizontal (26) después que primero haya apretado plano contra la bandeja el soporte de la parte posterior.
- o. Colocar la cubierta de la impresora otra vez sobre la impresora (5).
- p. Ahora transportar el papel girando la rueda de alimentación del papel en la dirección del reloj hasta que la perforación de la segunda hoja aparece encima de la cabeza impresora.
- q. Finalmente pulsar la tecla ON-LINE y su impresora está lista para acción.

**Nota:** ; Asegúrense de que su impresora está fijada a la longitud correcta del papel! (Véase el ajuste del conmutador DIP, página 40.)

## AJUSTE DE LA CABEZA IMPRESORA - 27

La cabeza impresora se puede fijar con la palanca de ajuste de la cabeza impresora 28. Usted la encontrará en el interior de la impresora en el lado de su mano derecha.

La palanca de ajuste está calibrada de fábrica. Esta posición es adecuada en principio para trabajo de impresión sin copias. Si desea usted una o más copias, entonces puede aumentar la fuerza de la impresión tirando hacia delante de la palanca de ajuste.

Si efectúa impresiones sin copias, entonces es aconsejable poner la palanca de nuevo en su posición original para prevenir deterioro innecesario.

## FUNCIONES DE PRUEBA

### Autopueba de la impresora

La facilidad de autopueba en su impresora le ofrece la oportunidad de comprobar las funciones principales de la impresora.

- Primero insertar una hoja de papel en la impresora.
- Después desconectar la impresora.
- Poner en funcionamiento de nuevo la impresora mientras mantiene oprimida la tecla L.Q. Mantengan pulsada la tecla hasta que la impresora comienza su autopueba.
- Usted puede interrumpir la acción de imprimir desconectando de nuevo. La autopueba imprime todos los caracteres sucesivamente en calidad de dibujo durante 5 líneas y modo LQ durante 5 líneas en un patrón continuo.

### Impresión de las posiciones de los interruptores basculantes (DIP)

Si se presiona el conmutador LINE FEED (avance de línea) durante la puesta en funcionamiento, se imprime información sobre el ajuste DIP SWITCH (interruptores basculantes).

### Vuelco hexadecimal de memoria

La facilidad de vuelco hexadecimal de memoria es intencionada solamente para localizar los posibles errores en sus programas ofreciéndole un resultado impreso hexadecimal de su trabajo.

- Primero desconectar la impresora.
- Enciéndase otra vez mientras se mantiene pulsada la tecla F.F.

Después de esto, serán impresos 16 bytes de datos de entrada sobre una línea a la vez. Si el número de datos de entrada es menor de los 16 bytes y es necesario imprimirlos todos ellos, pulsar la tecla ON-LINE (en línea).

Después de la impresión, pulsar la tecla ON-LINE para volver a la función de vuelco de memoria desde el estado OFF-LINE (fuera de línea). El modo "Carácter Calidad de Letra" (Letter Quality) puede ser ajustado presionando la tecla LQ durante el modo OFF-LINE.

Esta función puede terminarse de cualquiera de los siguientes modos:



1. Desconectar la alimentación de red, espérense 2 segundos, y vuélvase a conectar de nuevo.
2. Mandar la señal INITIAL desde el interfaz paralelo.

## FUNCIÓN DE AJUSTE DE DISTANCIA ENTRE CARACTERES

La distancia entre caracteres puede ajustarse manejando los conmutadores del panel frontal de la impresora. Sígase el procedimiento descrito a continuación.

1. Mientras la impresora se encuentra en el estado ON-LINE, pulsar la tecla ON-LINE/SELECT y mantenerla pulsada más de 1 segundo. El testigo ON-LINE comenzará a encenderse intermitentemente.
2. La distancia entre caracteres se selecciona pulsando las teclas LINE FEED/→ ó FORM FEED/← mientras el testigo ON-LINE está encendido intermitentemente. Las distancias entre caracteres disponibles están marcadas sobre la cubierta de la impresora; la cabeza impresora se desplaza a la posición que corresponde a la distancia seleccionada. Pulsar la tecla LINE FEED/→ para mover la cabeza impresora hacia la derecha, y pulsar la tecla FORM FEED/← para mover la cabeza impresora hacia la izquierda. La cabeza impresora se desplaza en incrementos de 10 columnas.

La posición de la cabeza impresora corresponde a la siguiente distancia entre caracteres.

Columna	Distancia entre caracteres
0	Ajuste por código (ajuste de distancia por comando)
10	Pica (10 cpi) (caracteres por pulgada)
20	Elite (12 cpi)
30	Pica condensado
40	Elite condensado (en modo MSX ignorado)
50	Proporcional

3. Pulsar la tecla LQ/SET para ajustar el tipo de distancia entre caracteres seleccionado. Sonará el zumbador y la impresora volverá al estado ON-LINE. (El indicador cesará de lucir intermitentemente y permanecerá encendido).

Si se selecciona por el procedimiento anterior otro tipo de distancia entre caracteres que no sea "ajuste por código" (columna 0), comandos de ajuste de caracteres serán ignorados, sin importar el modo de ajuste utilizado.

## **AJUSTE DE INTERRUPTOR DIP (EN CÁPSULA DE CIRCUITO INTEGRADO)**

El modo operativo (MSX, IBM, EPSON, ó PRESTEL), y funciones ulteriores, puede seleccionarse utilizando los interruptores DIP, que se encuentran en el lado posterior de la impresora (29) . Los interruptores DIP son leídos después del proceso de inicialización. Este proceso tiene lugar en el momento que el interruptor de encendido es puesto en ON, o al introducir la señal INITIAL desde el ordenador central.

Cuando la impresora sale de fábrica, todos los interruptores están puestos en OFF (desconectado).

Asegurarse de que está desconectada la tensión (OFF) al ajustar los interruptores DIP.

Para más detalles, véanse las páginas

**Nota 1:** Los modos operativos pueden seleccionarse sólomente utilizando los interruptores DIP DSW 1-1 y 1-2.

**Nota 2:** En los modos EPSON y PRESTEL, el ajuste del interruptor DIP DSW 1-8 determina la validez o invalidez de los caracteres de carga adicional. Si estos caracteres son válidos, el tamaño del buffer de comunicación es reducido desde 2.3 Kbytes á 0.7 Kbytes.

En el modo IBM, el buffer de comunicación siempre es 2.3 Kbytes.

En el mode MSX, es 8 Kbytes.

## **PRECAUCIONES PARA EL USO**

- Utilizar solamente una tensión de fuente de alimentación dentro de la gama especificada.
- No tocar la cabeza impresora inmediatamente después de imprimir ya que puede estar muy caliente durante el funcionamiento.
- Préstese cuidado a no doblar la cinta durante la instalación.
- Después de cortar la alimentación, espérense por lo menos dos segundos antes de poner otra vez la impresora en función. Si no lo hace, es probable que el proceso de inicialización sea ejecutado incorrectamente.
- Evitar luz de sol directa, humedad y polvo durante el uso de la impresora.
- No efectuar ningún proceso de imprenta a no ser que haya cinta y papel en la impresora.
- No instalar nunca la unidad tractor al usar la alinentación por fricción para hojas de papel cortadas (sueltas).
- Al utilizar papel continuo, la varilla sujetapapel se debe colocar en el lado del rodillo porque si no se puede atascar el papel en la impresora.
- Coloque la impresora sobre una mesa o escritorio de superficie plana y firme, para evitar que se deforme la envoltura inferior de plástico debido al pesado transformador dentro de la impresora.



## LOCALIZACION DE FALLOS

Si su impresora no funciona debidamente, intente localizar la causa utilizando la siguiente lista de comprobación:

1. **La impresora no imprime y el indicador de ENCENDIDO (POWER ON) no se enciende.**

Debe de ocurrir algo en la fuente de alimentación. Comprobar el interruptor y la conexión del cable de alimentación.

2. **La impresora no imprime mientras que el indicador de ENCENDIDO (POWER ON) se enciende.**

Primero comprobar si la cassette de cinta se ha instalado correctamente. Intentar primero la autopruueba de la impresora. Si funciona la autopruueba, comprobar el cable de conexión con el interfaz de la impresora. Si todo parece estar en orden, podría haber un fallo en el programa de ordenador u ordenador mismo.

3. **La impresora funciona correctamente pero el papel no es alimentado debidamente.**

Probablemente el papel se ha atascado dentro de la impresora. Quitar el papel e insertarlo correctamente (o una hoja nueva).

4. **El impreso es demasiado claro o manchado.**

- El ajuste de la cabeza impresora no está correcto: En este caso, ajústese debidamente de acuerdo con el papel que se esté usando.
- La cassette de cinta no ha sido colocada debidamente.
- La cinta de tinta está vieja y desgastada.

Reemplazar la cinta por una nueva. (Número de tipo SBC 436.)

Se puede utilizar la facilidad de autopruueba de la impresora para comprobar la calidad de tinta de la cinta.

5. **Se ha encendido el indicador de PAPER OUT.**

Ha sido detectada una condición de error. Desconectar la impresora de la red y después les encenderla de nuevo (después de 2 segundos).

## DIP SWITCH SETTINGS

The DIP switches are located at the back of the printer, behind the plastic lid.

Set all DIP switch positions with the power OFF.

The DIP switches are read after the initialisation process. This process takes place when the power switch is turned on, or when the printer receives the INITIAL signal through the parallel interface.

When the printer is shipped from the factory, all switches are set to OFF.

### Mode selection

The settings of DIP switches 1-1 and 1-2 determine the printer operation mode. Refer to the table below. (Note that the factory setting specifies the MSX mode.)

Switch 1-1	Switch 1-2	Mode
OFF	OFF	MSX
OFF	ON	IBM
ON	OFF	EPSON
ON	ON	PRESTEL

The meanings of the settings of DIP switches 1-3 through 2-2 depend on the mode selected by switches 1-1 and 1-2. Refer to the tables on the following pages.



## MSX mode

Switch	Function	ON	OFF
1-1	Mode selection	(See page 42)	
1-2	Mode selection	(Do)	
1-3	International character	(See table below)	
1-4	International character	(Do)	
1-5	Page length	(See table below)	
1-6	Page length	(Do)	
1-7	Character table selection	PRESTEL	MSX
1-8	Italic Mode	Valid	Invalid
2-1	Zero font selection	Slashed	Unslashed
2-2	1 inch Skip perforation	Valid	Invalid

## Page Length Designation

Page length	Switch	
	1-5	1-6
14 inch	ON	ON
12 inch	OFF	OFF
11 inch	ON	OFF
8 inch	OFF	ON

## International Character Set Selection

International Character	Switch	
	1-3	1-4
U.K.	OFF	OFF
SWEDEN	ON	OFF
ITALY	OFF	ON
BELGIUM	ON	ON

**Note:** If the serialnumber of the printer starts with JM00. the switches 1-3, 1-4 and 1-7 are not used in MSX mode.  
The printer will react like these switches are OFF independent from the position of these switches.

IBM mode

Switch	Function	ON	OFF
1-1	Mode selection	(See page 42)	
1-2	Mode selection	(Do)	
1-3	International character	(See table below)	
1-4	International character	(Do)	
1-5	International character	(Do)	
1-6	Page length	12 inch	11 inch
1-7	CR Code selection	CR+LF	AUTO FEED
1-8	Character set	Set 2	Set 1
2-1	CSF mode	Valid	Invalid
2-2	1 inch Skip perforation	Valid	Invalid

International Character  
Set Selection

International character	1-3	Switch	
		1-4	1-5
U.S.A.	ON	ON	ON
FRANCE	ON	ON	OFF
GERMANY	ON	OFF	ON
U.K.	ON	OFF	OFF
DENMARK	OFF	ON	ON
SWEDEN	OFF	ON	OFF
ITALY	OFF	OFF	ON
SPAIN	OFF	OFF	OFF



## EPSON mode

Switch	Function	ON	OFF
1-1	Mode selection	(See page 42)	
1-2	Mode selection	(Do)	
1-3	International character	(See table below)	
1-4	International character	(Do)	
1-5	International character	(Do)	
1-6	Page length	12 inch	11 inch
1-7	CR Code selection	CR+LF	AUTO FEED
1-8	Download character	Valid	Invalid
2-1	CSF mode	Valid	Invalid
2-2	1 inch Skip perforation	Valid	Invalid

**Note:** In EPSON mode, DIP switch 1-8 determines whether or not download characters are valid. When download characters are valid, the communication buffer is reduced from 2.3K bytes to 0.7K bytes.

## International Character Set Selection

International character	Switch		
	1-3	1-4	1-5
U.S.A.	ON	ON	ON
FRANCE	ON	ON	OFF
GERMANY	ON	OFF	ON
U.K.	ON	OFF	OFF
DENMARK	OFF	ON	ON
SWEDEN	OFF	ON	OFF
ITALY	OFF	OFF	ON
SPAIN	OFF	OFF	OFF

## PRESTEL mode

Switch	Function	ON	OFF
1-1	Mode selection	(See page 42)	
1-2	Mode selection	(Do)	
1-3	International character	(See table below)	
1-4	International character	(Do)	
1-5	No use		
1-6	Page length	12 inch	11 inch
1-7	CR Code selection	CR+LF	AUTO FEED
1-8	Download character	Valid	Invalid
2-1	CSF mode	Valid	Invalid
2-2	1 inch Skip perforation	Valid	Invalid

**Note:** In PRESTEL mode, DIP switch 1-8 determines whether or not download characters are valid. When download characters are valid, the communication buffer is reduced from 2.3K bytes to 0.7K bytes.

## International Character Set Selection

International character	Switch	
	1-3	1-4
U.K.	OFF	OFF
SWEDEN	ON	OFF
ITALY	OFF	ON
BELGIUM	ON	ON

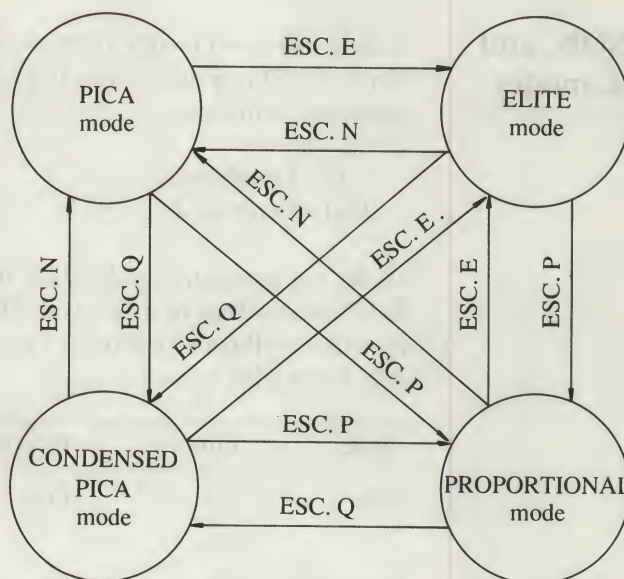


# PRINT MODE PRIORITIES

In all operation modes, the default print mode (restored by a reset command) specifies Pica (10 cpi) character pitch.

## MSX mode

There are four print modes (character pitches) that can be selected by command in MSX operation mode: Pica (10 cpi), Elite (12 cpi), Condensed Pica (17 cpi), and Proportional. In the illustration below, arrows indicate a change from one mode to another. Send the control code with which the appropriate arrow is labeled to execute the desired change of print mode.



Certain print functions are available within the four print modes (Superscript, Subscript, Letter-quality, Double-strike, Bold). The following priorities are effective.

Super/Subscript > LQ > Double-strike  
Condensed Pica mode > LQ  
Condensed Pica mode > Bold

Note that specification of Condensed Pica mode overrides both the LQ and Bold print functions (i.e. 17 cpi characters cannot be printed with letter quality or in boldface).

The Super/Subscript and Italic print functions have the same priority. If one of these functions is specified without the other being canceled, the later specification is valid. When the later specification is canceled, the earlier specification becomes valid. These specifications are stored in a memory stack.

**Note:** When character pitch has been selected using the switches on the front panel, the following commands are ignored.

ESC N	Select Pica Mode
ESC E	Select Elite Mode
ESC Q	Select Condensed Pica Mode
ESC P	Select Proportional Mode

These are the commands that appear in the above table. In other words, the print mode cannot be changed by software commands if it is set by hardware switches.

## IBM, EPSON, and PRESTEL modes

In these operation modes, there are four print modes available by software command: Elite, Proportional, Bold, and Condensed. The priorities of these modes are as follows.

Elite > Proportional  
Bold > Condensed

Modes can also be mixed: Bold can be mixed with Elite and Proportional, and Condensed can be mixed with Elite. (However, Condensed mode is overridden by Proportional mode.) For the results of specific combinations, refer to the table below.

Mode	Elite	Proportional	Bold	Codensed
Elite	—	Elite	Elite	Condensed Elite
Proportional	Elite	—	Bold Proportional	Proportional
Bold	Bold Elite	Bold Proportional	—	Bold
Condensed	Condensed Elite	Proportional	Bold	—

There are thus four character pitches that can be chosen by command: Elite (12 cpi), Condensed Pica (17 cpi), Condensed Elite (20 cpi), and Proportional. In addition, characters can be printed at 10 cpi by pressing the appropriate switches on the front panel. (For details, refer to page 4.)

**Note:** When the character pitch has been selected using the switches on the front panel, the following commands are ignored.

ESC P	Terminate Elite Mode
ESC M	Select Elite Mode
SI	Select Condensed Mode
ESC SI	Select Condensed Mode
DC2	Terminate Condensed Mode
ESC p n	Select/Terminate Proportional Mode
ESC ! n	Select Mixed Print Modes



(With the ESC ! n command, only the lower three bits of the n parameter are ignored.)

As a result of the fact that these commands are ignored, when the character pitch is set using the front panel switches, the only print mode that can be turned on or off by software commands is the Bold print mode.

The Super/Subscript, Letter-quality, and Double-strike print functions have the following priorities.

Super/Subscript > LQ > Double-strike

The Italic, Double-width, and Underline print functions do not conflict with one another, and can be used together.

# PRINT MODE SPECIFICATIONS

\*: Includes half dot

Print Mode		Character Structure H x V + Space	Maximum Number of Columns	Character Spacing CPI	Printing Speed CPS	Minimum Dot Spacing H x V inches	Character Size H x V mm (dot)	Number of passes
Draft	Pica	12* x 9	80	10	120	1/120* x 1/72	2.1 x 2.5 (9* x 7)	1
	Elite	12* x 9	96	12	120	1/144* x 1/72	1.8 x 2.5 (9* x 7)	1
	Condensed Elite	12* x 9	160	20	100	1/240* x 1/72	1.2 x 2.5 (9* x 7)	1
	Condensed	14* x 9	137	17	85	1/240* x 1/72	1.2 x 2.5 (9* x 7)	1
LQ	Pica	24* x 18	80	10	25	1/240* x 1/144	2.3 x 2.5 (19* x 13)	2
	Elite	24* x 18	96	12	30	1/288* x 1/144	2.0 x 2.5 (19* x 13)	2
Draft Italic	Pica	16* x 9	80	10	100	1/240* x 1/72	2.7 x 2.5	1
	Elite	16* x 9	96	12	120	1/288* x 1/72	2.3 x 2.5	1
	Condensed Elite	16* x 9	160	20	100	1/240* x 1/72	1.9 x 2.5	1
	Condensed	16* x 9	137	17	85	1/240* x 1/72	1.9 x 2.5	1
LQ Italic	Pica	32* x 18	80	10	25	1/480* x 1/144	2.9 x 2.5	2
	Elite	32* x 18	96	12	30	1/576* x 1/144	2.5 x 2.5	2
Graphics	Standard density	n x 8 or 9	480 dot	-	720 dot/s	1/60 x 1/72	-	1
	Double-density	n x 8 or 9	960 dot	-	600 dot	1/120 x 1/72	-	1
	Double-speed, Double-density	n x 8	960* dot	-	1440* dot/s	1/120* x 1/72	-	1
	Quadruple-density	n x 8	1920* dot	-	1200* dot/s	1/240* x 1/72	-	1
	576 dot	n x 8	576 dot	-	720 dot/s	1/240* x 1/72	-	1
	640 dot	n x 8	640 dot	-	400 dot/s	1/80 x 1/72	-	1
	720 dot	n x 8	720 dot	-	450 dot/s	1/90 x 1/72	-	1
	768 dot	n x 8	768 dot	-	480 dot/s	1/96 x 1/72	-	1
	1088 dot	n x 8	1088 dot	-	680 dot/s	7/96 x 1/72	-	1
	1152 dot	n x 8	1152 dot	-	720 dot/s	1/144 x 1/72	-	1



## CONTROL CODES

The printer has four operation ("emulation") modes: MSX, IBM, EPSON, and PRESTEL. These modes are selected by setting DIP switches 1-1 and 1-2. (Refer to page 42.)

The software codes that control the printer in the different operation modes are described in the following sections. There are two main sections. The first explains the use of MSX mode control codes. The second section explains the control codes for the IBM, EPSON, and PRESTEL modes.

**Note:** All references to EPSON control codes indicate the EPSON FX command set.

Programmers should be aware that some computers will not output the correct data to the printer for certain codes. Some of the commands used with this printer (e.g. those for printing graphic data) require the inclusion of numeric parameters (to specify dot patterns etc.). Sometimes, if the value of a parameter is the same as the code for a control function, the host computer will direct the printer to execute the control function, rather than pass on the actual numeric value. For example, if the value of a parameter is 9 decimal, some computers will direct the printer to execute a horizontal tab, rather than pass along the data (which could, for instance, specify a dot pattern in graphic printing). This is not a problem with the printer itself, but rather with the operating systems of certain computers. Carefully check the host computer's operation manual to see how it responds to parameters whose value is in the range from 0 to 31 decimal.

## MSX CONTROL CODES

This section describes the control codes that are effective when the printer is in the MSX operation mode. (The factory settings of the printer designate the MSX operation mode.)

Normally, this mode is used with an MSX computer. The programme samples will run on such a computer.

### Print Commands

These four commands initiate actual printing of a preceding string of character data.

#### 1. **CR**

#### (13) Decimal (0D) Hexadecimal

This code terminates input of a line, and initiates printing. (If no print data is input prior to the CR code, the print head does not move.) After printing, the carriage returns to the margin, and no line feed is performed. Subsequent print data starts at the left margin.

2. **LF**

### **(10) Decimal (0A) Hexadecimal**

This code has the same effect as the CR code, except that a line feed is performed after the data is printed. The pitch of the line feed is set by the line feed spacing commands (ESC A, ESC B, ESC T n, ESC Z n).

3. **VT**

### **(11) Decimal (0B) Hexadecimal**

This code has the same effect as the LF code.

4. **FF**

### **(12) Decimal (0C) Hexadecimal**

This code terminates input of a line, and initiates printing. After the line is printed, the paper is fed so that the print head is positioned at the top of the next page. The distance by which the paper is fed is initially determined by the setting of DIP switches 1-5 and 1-6, and can be modified by the page length setting commands (ESC O n, ESC O I n).

## **Character Pitch Selection Com- mands**

These four commands are used to change the character pitch. Note that none of these commands are effective if a character pitch has been selected by pressing the switches on the front panel of the printer.

The printer enters the newly selected mode after printing out all print data in the buffer. It is thus possible to use more than one character pitch on a single line.

At the end of this section is a short programme example that shows how to select each character pitch.

5. **ESC N**

### **(27 78) Decimal (1B 4E) Hexadecimal**

This command selects the Pica character pitch (10 cpi).

Note that the Pica character pitch is selected by default when the printer is turned on.

6. **ESC E**

### **(27 69) Decimal (1B 45) Hexadecimal**

This command selects the Elite character pitch (12 cpi).

7. **ESC Q**

### **(27 81) Decimal (1B 51) Hexadecimal**

This command selects the Condensed print mode (17 cpi).

Note that this command overrides the LQ (ESC !) and Bold (ESC C B) print functions, but does not cancel them. That is, the functions are re-activated when another character pitch is selected.

8. **ESC P**

### **(27 80) Decimal (1B 50) Hexadecimal**

This command selects the Proportional print mode, where different characters have different widths (e.g. a "W" is wider than an "i").



```

10 REM CHARACTER PITCHES (ESC N, ESC E, ESC Q, ESC P)
20 REM DEFAULT IS PICA
30 REM ELITE (ESC E) CONDENSED (ESC Q)
40 REM PROPORTIONAL (ESC E) PICA (ESC N)
50 OPEN "LPT:" FOR OUTPUT AS #1
60 REM SELECT PICA BY DEFAULT
70 PRINT #1,"THIS IS A PRINT SAMPLE - PICA (10 CPI)"
80 REM SELECT ELITE (12 CPI)
90 PRINT #1,CHR$(27);"E";
100 PRINT #1,"THIS IS A PRINT SAMPLE - ELITE (12 CPI)"
110 REM SELECT CONDENSED PICA (17 CPI)
120 PRINT #1,CHR$(27);"Q";
130 PRINT #1,"THIS IS A PRINT SAMPLE - CONDENSED PICA (17 CPI)"
140 REM SELECT PROPORTIONAL
150 PRINT #1,CHR$(27);"P";
160 PRINT #1,"THIS IS A PRINT SAMPLE - PROPORTIONAL "
170 REM RESELECT PICA
180 PRINT #1,CHR$(27);"N";
190 PRINT #1,"THIS IS A PRINT SAMPLE - PICA (10 CPI)"
200 REM ALL PITCHES ON ONE LINE
210 PRINT #1, "PICA ";CHR$(27);"E";"ELITE ";CHR$(27);"Q";"CONDENSED ";
220 PRINT #1,CHR$(27);"P";"PROPORTIONAL "
230 CLOSE
240 END

```

```

THIS IS A PRINT SAMPLE - PICA (10 CPI)
THIS IS A PRINT SAMPLE - ELITE (12 CPI)
THIS IS A PRINT SAMPLE - CONDENSED PICA (17 CPI)
THIS IS A PRINT SAMPLE - PROPORTIONAL
THIS IS A PRINT SAMPLE - PICA (10 CPI)
PICA ELITE CONDENSED PROPORTIONAL

```

## Double-Width Printing Commands

The following two commands are used to select and cancel the double-width print function.

### 9. **SO**

#### (14) Decimal (0E) Hecadecimal

This code selects the double-width print function, which is valid for both character and graphic data.

### 10. **SI**

#### (15) Decimal (0F) Hexadecimal

This code cancels the double-width print function.

```

10 REM DOUBLE-WIDTH PRINTING (SO, SI)
20 OPEN "LPT:" AS #1
30 PRINT #1,"REGULAR CHARACTERS"
40 REM SELECT DOUBLE-WIDTH PRINTING FUNCTION
50 PRINT#1,CHR$(14);
60 PRINT #1,"DOUBLE-WIDE CHARACTERS"
70 REM CANCEL DOUBLE -WIDTH PRINTING FUNCTION
80 PRINT #1,CHR$(15);
90 PRINT #1,"REGULAR CHARACTERS AGAIN"
100 CLOSE
110 END

```

```

REGULAR CHARACTERS
DOUBLE-WIDE CHARACTERS
REGULAR CHARACTERS AGAIN

```

## Letter-Quality Print Function

These two commands are used to select and cancel the letter-quality (LQ) print function, with which characters are printed more clearly (and more slowly) than usual. The LQ print function produces the highest-quality output available from a dot matrix printer.

### 11. | | | |-----|---| | ESC | ! | |-----|---|

#### (27 33) Decimal (1B 21) Hexadecimal

This command selects the Letter-quality print function. This function has no effect on graphic printing.

This function is ineffective when the Condensed character pitch (17 cpi) is selected. However, the selection is retained in the printer's memory, and the LQ function becomes effective if the character pitch is subsequently changed from 17 cpi.

The priority of the LQ function is as follows.

Super/Subscript > LQ > Double-strike

In other words, the LQ function is overridden by the superscript and subscript functions, and in turn overrides the double-strike function. Cancellation of a higher-priority function activates the lower-priority function, if the latter has been selected.

### 12. | | | |-----|---| | ESC | " | |-----|---|

#### (27 34) Decimal (1B 22) Hexadecimal

This command cancels the LQ function.

```
10 REM LQ PRINTING (ESC !, ESC ")
20 OPEN "LPT:"AS #1
30 REM ENSURE REGULAR CHARACTERS
40 PRINT #1,CHR$(27);CHR$(34);
50 PRINT #1,"REGULAR CHARACTERS"
60 REM SELECT LQ FUNCTION
70 PRINT #1,CHR$(27);"!";
80 PRINT #1,"LQ CHARACTERS"
90 PRINT #1,CHR$(27);CHR$(34);
100 REM CANCEL LQ FUNCTION
110 PRINT #1,"REGULAR CHARACTERS AGAIN"
120 CLOSE
130 END
```

```
REGULAR CHARACTERS
LQ CHARACTERS
REGULAR CHARACTERS AGAIN
```

## Superscript and Subscript Functions

The following four commands are used to select and cancel superscripting and subscripting of text. Note that selecting one of these functions automatically cancels the other.

For details concerning the priority of these functions, refer to the explanation of the LQ function (command 11. in this section). Note also that these functions have the same priority as the italic function, so that the function most recently selected is valid, provided that it has not subsequently been can-



celled. Superscripts and subscripts cannot be printed in italic form.

The superscript and subscript functions are not valid for graphic printing.

13. **ESC C S**

**(27 67 83) Decimal (1B 43 53) Hexadecimal**

This command selects the superscript function. This function is canceled by either the ESC C s command discussed below, or by selecting subscript printing via the ESC C U command.

14. **ESC C s**

**(27 67 115) Decimal (1B 43 73) Hexadecimal**

This command cancels the superscript function.

15. **ESC C U**

**(27 67 85) Decimal (1B 43 55) Hexadecimal**

This command selects the subscript function. This function is canceled by either the ESC C u command discussed below, or by selecting superscript printing via the ESC C S command.

16. **ESC C u**

**(27 67 117) Decimal (1B 43 75) Hexadecimal**

This command cancels the subscript function.

```
10 REM SUPERSCRIPT (ESC C S) AND SUBSCRIPT (ESC C U) FUNCTIONS
20 OPEN "LPT:" AS #1
30 PRINT #1, CHR$(27); "CS"; "SUPERSCRIPT";
40 PRINT #1, CHR$(27); "Cs"; "NORMAL";
50 PRINT #1, CHR$(27); "CU"; "SUBSCRIPT";
60 PRINT #1, CHR$(27); "Cu"; "NORMAL AGAIN"
70 REM DIRECTLY FROM SUPERSCRIPT TO SUBSCRIPT
80 PRINT #1, CHR$(27); "CS"; "SUPER"; CHR$(27); "CU"; "SUB"
90 PRINT #1, CHR$(27); "Cu"; "NORMAL AGAIN "
100 CLOSE
110 END
```

```
SUPERSCRIPTNORMALSUBSCRIPTNORMAL AGAIN
SUPER SUB
NORMAL AGAIN
```

## Italic Printing

These two commands select and cancel printing of italic characters. The only type of characters that cannot be printed in italic form are superscripts and subscripts. These latter two functions have the same priority as the italic printing function, so that the function most recently selected (and not subsequently canceled) is valid.

The italic function is not valid for graphic printing.

17. **ESC C I**

**(27 67 73) Decimal (1B 43 49) Hexadecimal**

This command selects the italic printing function.

## 18. ESCCi

### (27 67 105) Decimal (1B 43 69) Hexadecimal

This command cancels the italic printing function.

```
10 REM ITALIC PRINTING FUNCTION (ESC C I)
20 OPEN "LPT:" AS #1
30 PRINT #1,"NORMAL ";
40 PRINT #1,CHR$(27);"CI";"ITALICS ";
50 PRINT #1,CHR$(27);"C1";"NORMAL AGAIN "
60 CLOSE
70 END
```

NORMAL *ITALICS* NORMAL AGAIN

## Bold Printing Function

The following two commands select and cancel the bold printing function, used to print characters in boldface. Bold characters are printed twice, with a 1/2-dot horizontal offset (1/120 inch in Pica mode, 1/144 inch in Elite mode).

The bold printing function is ignored while the printer is in Condensed print mode (17 cpi). The selection of the function is, however, retained in the printer's memory, however, retained in the printer's memory, and becomes effective if the character pitch is changed before the bold printing function is canceled via the ESC C b command.

## 19. ESCCB

### (27 67 66) Decimal (1B 43 42) Hexadecimal

This command selects the bold printing function.

## 20. ESCCb

### (27 67 98) Decimal (1B 43 62) Hexadecimal

This command cancels the bold printing function.

```
10 REM BOLD PRINTING FUNCTION (ESC C B)
20 OPEN "LPT:" AS #1
30 PRINT #1,"NORMAL ";
40 PRINT #1,CHR$(27);"CB";"BOLD ";
50 PRINT #1,CHR$(27);"Cb";"NORMAL AGAIN"
60 CLOSE
70 END
```

NORMAL **BOLD** NORMAL AGAIN

## Double-Strike Function

The following two commands select and cancel the double-strike function, used to print emphasised characters. With the double-strike function, characters are printed once, the paper is advanced 1/144 inch, the character is printed again, and the paper returns to its original position.

The double-strike function is ignored while the LQ function is selected. The selection of the double-strike function is, however, retained in the printer's memory, and becomes effective if the LQ function is canceled.



21. **ESC C D**

**(27 67 68) Decimal (1B 43 44) Hexadecimal**

This command selects the double-strike function.

22. **ESC C d**

**(27 67 100) Decimal (1B 43 64) Hexadecimal**

This command cancels the double-strike function.

```
10 REM DOUBLE-STRIKE FUNCTION
20 OPEN "LPT:"AS #1
40 PRINT #1,"NORMAL ";
50 PRINT #1,CHR$(27);"CD";"DOUBLE-STRIKE ";
60 PRINT #1,CHR$(27);"Cd";"NORMAL AGAIN "
70 CLOSE
80 END
```

NORMAL DOUBLE-STRIKE NORMAL AGAIN

## Horizontal Tab Commands

The following commands are used to set and clear horizontal tabs.

23. **HT**

**(09) Decimal (09) Hexadecimal**

This command is used to move the print head to the next horizontal tab position on the right. Default tabs are set in every eighth column. The default tabs can be altered by using the ESC ( ... command discussed below).

24. **ESC ( nnn nnn ... .**

**(27 40 nnn 44 nnn 44 ... 46) Decimal  
(1B 28 nnn 2C nnn ... 2E) Hexadecimal**

This command is used to set tab stops in the column positions specified by the nnn parameters. Up to 32 tab stops can be set at any given time. Tab positions are defined in terms of columns, and the physical location of the tabs is calculated according to the current character pitch. (If proportional spacing is selected, each column unit is 1/10 inch, as for Pica.) The physical location of tab stops is changed if the character pitch is subsequently changed.

Each nnn parameter is a three digit number, each digit of which is a number from 0 to 9 (30-39 hexadecimal in the code table). Parameters are separated by commas (",", 2C hexadecimal). The final parameter is followed by a period (".", 2E hexadecimal).

Tab positions must be specified in ascending order. Parameters that do not meet this criterion are ignored. If the command syntax is invalid, all tab stops are cleared.

25. **ESC ) nnn nnn ... .**

**(27 41 nnn 44 nnn 44 ... 46) Decimal  
(1B 29 nnn 2C nnn ... 2E) Hexadecimal**

This command cancels the individual tab settings specified in the nnn parameters. The syntax and method of specifying the nnn parameters are the same as for the ESC ( sequence. If there is no tab set in the specified position, the parameter is ignored.

The current vertical position of the print head is made the new top of form, so this command should only be sent on the first line of the new page.



28. 

ESC	O	I	nn
-----	---	---	----

(27 79 73 nn) Decimal (1B 4F 49 nn) Hexadecimal

This command specifies the page length in inches. the nn parameter is a two-digit number, each digit of which is a number from 0 to 9 (30-39 hexadecimal). Thus, nn must be a whole number; no decimal fractions are allowed.

```
10 REM SET PAGE LENGTH (ESC O n, ESC O I n)
20 OPEN "LPT:" AS #1
30 REM SET PAGE LENGTH OF 5 LINES
40 PRINT #1, CHR$(27);"0005";
50 PRINT #1,"TOP OF PAGE 1"
60 PRINT #1,CHR$(12);
70 PRINT #1,"TOP OF PAGE 2"
80 REM SET PAGE LENGTH TO 1 INCH
90 PRINT #1,CHR$(27);"01";"01";
100 PRINT #1,"TOP OF PAGE 1"
110 PRINT #1,CHR$(12);
120 PRINT #1,"TOP OF PAGE 2"
130 CLOSE
140 END
```

TOP OF PAGE 1

TOP OF PAGE 2  
TOP OF PAGE 1

TOP OF PAGE 2

## Perforation Skip Function

These two commands select and cancel the perforation skip function, which is used to skip over the inter-page perforation in fanfold paper.

If DIP switch 2-2 is set to ON, a default perforation skip of one inch is set.

29. 

ESC	O	S	nn
-----	---	---	----

(27 79 83 nn) Decimal (1B 4F 53 nn) Hexadecimal

This command sets a perforation skip of nn lines. The nn parameter is a two-digit number, each digit of which is a number from 0 to 9 (30-39 hexadecimal).

If the print head is positioned so that fewer than nn lines remain in the current page, the printer executes a form feed, and moves the print head to the top of the next page. If the value of the nn parameter exceeds the total number of lines on a page, the command is ignored.

30. 

ESC	O	S	"00"
-----	---	---	------

 (27 79 83 48 48) Decimal  
(1B 4F 53 30 30) Hexadecimal

This command cancels the perforation skip function. As can be seen from the syntax, this command in effect sets a perforation skip of zero lines.

```
10 REM SET AND CANCEL PERFORATION SKIP (ESC O S nn)
20 OPEN "LPT:" AS #1
30 REM SET PAGE LENGTH OF 5 LINES
40 PRINT #1,CHR$(27);"0005";
50 REM SET PERFORATION SKIP TO 2 LINES
60 PRINT #1,CHR$(27);"OS02";
70 FOR I=1 TO 10
80 PRINT #1,"LINE #";I
90 NEXT I
100 REM CANCEL PERFORATION SKIP
110 PRINT #1,CHR$(27);"OS00";
120 FOR I=1 TO 10
130 PRINT #1,"LINE #";I
140 NEXT I
150 CLOSE
160 END
```

LINE # 1  
LINE # 2  
LINE # 3

LINE # 4  
LINE # 5  
LINE # 6

LINE # 7  
LINE # 8  
LINE # 9

LINE # 10  
LINE # 1  
LINE # 2  
LINE # 3  
LINE # 4  
LINE # 5  
LINE # 6  
LINE # 7  
LINE # 8  
LINE # 9  
LINE # 10

## Margin Setting Commands

These two commands set the right and left margins.

31. 

ESC	/	nnn
-----	---	-----

(27 47 nnn) Decimal (1B 2F nn) Hexadecimal

This command sets the right margin at the column position specified by nnn. The nnn parameter is a three-digit number, each digit of which is a number from 0 to 9 (30 to 39 hexadecimal).



The physical location of the margin is calculated in terms of the current character pitch. (If proportional spacing is being used, each column is 1/10 inch in width.) If the value of the nnn parameter exceeds the number of columns that can be printed (which varies with the character pitch), the command is ignored. The command is also ignored if it would result in the right margin being located less than 1/5 inch from the left margin.

When the printer receives this command, it clears its input buffer.

## 32. **ESC L nnn**

### (27 76 nnn) Decimal (1B 4C nnn) Hexadecimal

This command sets the left margin at the column position specified by nnn. The nnn parameter is a three-digit number, each digit of which is a number from 0 to 9 (30 to 39 hexadecimal).

The physical location of the margin is calculated in terms of the current character pitch. (If proportional spacing is being used, each column is 1/10 inch in width.) If the value of the nnn parameter exceeds the number of columns that can be printed (which varies with the character pitch), the command is ignored. The command is also ignored if it would result in the left margin being located less than 1/5 inch from the right margin.

When the printer receives this command, it clears its input buffer.

```
10 REM SET MARGINS (ESC / nnn, ESC L nnn)
20 OPEN "LPT:" AS #1
30 PRINT #1,"1234567890123456789012345678901234567890"
40 REM SET RIGHT MARGIN IN COLUMN 35
50 PRINT #1,CHR$(27);"/035";
60 PRINT #1,"RIGHT MARGIN AT COL 35"
70 PRINT #1,"1234567890123456789012345678901234567890"
80 REM SET LEFT MARGIN IN COLUMN 10
90 PRINT #1,CHR$(27);"L010";
100 PRINT #1,"LEFT MARGIN AT COL 10"
110 PRINT #1,"1234567890123456789012345678901234567890"
120 CLOSE
130 END
```

```
1234567890123456789012345678901234567890
RIGHT MARGIN AT COL 35
12345678901234567890123456789012345
67890
```

```
LEFT MARGIN AT COL 10
1234567890123456789012345
678901234567890
```

## Linefeed Spacing Commands

The four commands described below are used to set or change the linefeed spacing. Note that the default linefeed value is 1/6 inch.

## 33. **ESC A**

### (27 65) Decimal (1B 41) Hexadecimal

This command sets a linefeed value of 1/6 inch. This is the default linefeed value.

**34. ESC B****(27 66) Decimal (1B 42) Hexadecimal**

This command sets a linefeed value of 1/9 inch.

**35. ESC T nn****(27 54 nn) Decimal (1B 54 nn) Hexadecimal**

This command sets a linefeed value of nn/144 inch. The nn parameter is a two-digit number, each digit of which is a number from 0 to 9 (30-39 hexadecimal). Thus, the linefeed value can vary from 1/144 inch to 99/144 (11/16) inch.

**36. ESC Z nn****(27 90 nn) Decimal (1B 5A nn) Hexadecimal**

This command sets a linefeed value of nn/216 inch. The nn parameter is a two-digit number, each digit of which is a number from 0 to 9 (30-39 hexadecimal). Thus, the linefeed value can vary from 1/216 inch to 99/216 (11/24) inch.

```

10 REM LINEFEED SPACING (ESC A, ESC B, ESC T nn, ESC Z nn)
20 OPEN "LPT:" AS #1
30 REM DEFAULT SPACING (1/6 INCH)
40 FOR I=1 TO 3
50 PRINT #1,"1/6 INCH (6 LINES PER INCH)"
60 NEXT I
70 REM SET LINEFEED VALUE OF 1/9 INCH
80 PRINT #1,CHR$(27);"B";
90 FOR I=1 TO 3
100 PRINT #1,"1/9 INCH (9 LINES PER INCH)"
110 NEXT I
120 REM SET LINEFEED VALUE OF 12/144 INCH
130 PRINT #1, CHR$(27);"T";"12";
140 FOR I=1 TO 3
150 PRINT #1,"12/144 INCH (12 LINES PER INCH)"
160 NEXT I
170 REM SET LINEFEED VALUE OF 72/216 INCH
180 PRINT #1,CHR$(27);"Z";"72";
190 FOR I=1 TO 3
200 PRINT #1,"72/216 INCH (3 LINES PER INCH)"
210 NEXT I
220 REM SET LINEFEED VALUE OF 1/6 INCH
230 PRINT #1,CHR$(27);"A";
240 FOR I=1 TO 3
250 PRINT #1,"1/6 INCH (6 LINES PER INCH)"
260 NEXT I
270 CLOSE
280 END

```

```

1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/9 INCH (9 LINES PER INCH)
1/9 INCH (9 LINES PER INCH)
1/9 INCH (9 LINES PER INCH)
12/144 INCH (12 LINES PER INCH)
12/144 INCH (12 LINES PER INCH)
12/144 INCH (12 LINES PER INCH)
72/216 INCH (3 LINES PER INCH)

```

72/216 INCH (3 LINES PER INCH)

72/216 INCH (3 LINES PER INCH)

1/6 INCH (6 LINES PER INCH)

1/6 INCH (6 LINES PER INCH)

1/6 INCH (6 LINES PER INCH)



## Printing Direction Commands

These two commands control the printing direction. If printing is uni-directional, lines are always printed from left to right. If printing is bi-directional, the printer prints character data starting at the side closest to the current position of the print head. (Graphic data is always printed left-to-right.)

Note that bi-directional printing is faster. The default setting is for bi-directional printing.

37. **[ESC]** **[**

**(27 91) Decimal (1B 5B) Hexadecimal**

This command selects uni-directional printing.

38. **[ESC]** **]**

**(27 93) Decimal (1B 5D) Hexadecimal**

This command selects bi-directional printing.

```
10 REM PRINTING DIRECTION (ESC [ , ESC ] )
20 OPEN "LPT:" AS #1
30 REM BI-DIRECTIONAL BY DEFAULT
40 PRINT #1,"<----- BI-DIRECTIONAL"
50 PRINT #1,"----->"
60 REM SELECT DIRECTIONAL PRINTING
70 PRINT #1,CHR$(27); "[";
80 PRINT #1,"-----> UNI-DIRECTIONAL"
90 PRINT #1,"----->"
100 REM SELECT UNI-DIRECTIONAL
110 PRINT #1,CHR$(27); "]" ;
120 PRINT #1,"<----- BI-DIRECTIONAL"
130 PRINT #1,"----->"
140 CLOSE
150 END
```

```
<----- BI-DIRECTIONAL
----->
-----> UNI-DIRECTIONAL
----->
<----- BI-DIRECTIONAL
----->
```

## Paper-out Detection Function

Normally, when the printer runs out of paper, the PAPER OUT lamp lights, the buzzer sounds, and the printer stops printing. It is possible to make the printer ignore its automatic paper-out detection function. In such a case, the PAPER OUT lamp will not light, the buzzer will not sound, and the printer will not stop printing when it runs out of paper.

39. **[ESC]** **[q]**

**(27 113) Decimal (1B 71) Hexadecimal**

This command disables the paper-out detection function.

```
PRINT #1,CHR$(27);"q";
```

**40. ESC p****(27 112) Decimal (1B 70) Hexadecimal**

This command enables the paper-out detection function. (By default, the function is enabled.)

```
PRINT #1,CHR$(27);"p";
```

**Home Positioning****41. ESC CR****(27 13) Decimal (1B 0D) Hexadecimal**

This command causes the print head to move back to the left side of the paper.

**Reset****42. ESC @****(27 64) Decimal (1B 40) Hexadecimal**

This command returns the printer to its power-on state. All settings made by software commands (e.g. margins, tabs, printing mode) are canceled, all data in the print buffer is discarded, and all default settings are restored.

If MSX mode has been set by ESC R n, this command returns the printer to PRESTEL mode.

```
10 REM PRINTER RESET (ESC @)
20 OPEN "LPT:" AS #1
30 REM SET DOUBLE-STRIKE AND UNDERLINING
40 PRINT #1,CHR$(27);"CD";CHR$(27);"X";
50 PRINT #1,"THIS TEXT IS UNDERLINED AND DOUBLE-STRIKE "
60 REM RESET PRINTER
70 PRINT #1,CHR$(27);"@";
80 PRINT #1,"UNDERLINING AND DOUBLE-STRIKE HAVE BEEN RESET"
90 CLOSE
100 END
```

THIS TEXT IS UNDERLINED AND DOUBLE-STRIKE  
UNDERLINING AND DOUBLE-STRIKE HAVE BEEN RESET

**Buzzer****43. BEL****(07) Decimal (07) Hexadecimal**

This command causes the buzzer to sound for approximately one second.

```
10 REM SOUND BUZZER (BEL-ASCII CODE 07)
20 OPEN "LPT:" AS #1
30 REM SOUND BUZZER 10 TIMES
40 FOR I=1 TO 10
50 PRINT #1,CHR$(7);
60 NEXT I
70 CLOSE
80 END
```



Buffer Clear

44. CAN

(24) Decimal (18) Hexadecimal

This command deletes print data that has already been input. However, control functions are still valid.

```
10 REM BUFFER CLEAR (CAN-ASCII CODE 24)
20 OPEN "LPT:" AS #1
30 REM SELECT DOUBLE-WIDTH PRINTER FUNCTION
40 PRINT #1,CHR$(14);
50 PRINT #1,"ABCDEFGH";
60 REM CLEAR BUFFER
70 PRINT #1,CHR$(24)
80 PRINT #1,"HIJKLMN"
90 REM CANCEL DOUBLE-WIDTH PRINTING
100 PRINT #1,CHR$(15);
110 CLOSE
120 END
```

H I J K L M N

Graphic Mode Commands

These commands are used to print graphic data, making it possible to directly print patterns rather than just character data.

45. ESC G nnn mmmm ...

(27 71 nnn mmmm ...) Decimal  
(1B 47 nnn mmmm ...) Hexadecimal

This command prints graphic data at one of seven densities. The density (in the horizontal direction) is specified by the nnn parameter, which is a three-digit number, each digit of which is a number from 0 to 9 (30 to 39 hexadecimal). The selected density corresponds to the value of nnn as follows.

Value of nnn	Horizontal density
000 ≤ nnn ≤ 065	60 dots/inch
066 ≤ nnn ≤ 075	72 dots/inch
076 ≤ nnn ≤ 085	80 dots/inch
086 ≤ nnn ≤ 095	90 dots/inch
096 ≤ nnn ≤ 125	120 dots/inch
126 ≤ nnn ≤ 145	136 dots/inch
146 ≤ nnn ≤ 999	240 dots/inch

The mmmm parameter specifies the number of following bytes that the printer should interpret as graphic data. mmmm is a four-digit number, each digit of which is a number from 0 to 9 (30 to 39 hexadecimal). Thus, up to 9999 bytes of graphic data can be sent each time this command is used. Each byte of graphic data specifies the dot pattern of a single eight-dot column, and each of these columns corresponds to one horizontal dot.

If the number of graphic bytes specified by mmmm is such that the printed data cannot fit on a single line, the printer makes linefeeds in accordance with the current linefeed value. (Up to eight inches can fit on a line, so the number of bytes per line depends on the horizontal density specified by nnn.) After printing the specified number of bytes of graphic data, the printer is restored to the state it was in before graphic printing was specified (i.e. the previous character pitch, margins, printing functions, etc. remain effective).

Each byte of graphic data consists of eight bits, which correspond to individual dots in the vertical direction. The top dot in each column is specified by the least-significant-bit (LSB) of the byte. Refer to the chart below.

Dot	Value
•	1 LSB (top dot)
•	2
•	4
•	8
•	16
•	32
•	64
•	128 MSB (bottom dot)

To specify that a dot should be printed, include the value for that dot in the total value of the graphic data byte. For example, to print only the top and bottom dots in a column, add  $1 + 128 = 129$ , and specify 129 as the value of the graphic data byte. Likewise, to print all the dots in a column, add  $1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 = 255$ , and specify 255 as the value of the graphic data byte.

```

10 REM PRINT GRAPHIC DATA (ESC G ...)
20 REM TO SUPPRESS THE GENERATION OF TABS BY THE MSX SYSTEM
30 POKE &HF418,1
40 REM SELECT 60 DOTS PER INCH, AND PRINT 256 ASCENDING BYTES
50 LPRINT "60 DPI"
60 LPRINT CHR$(27);"G";"065";"0256";
70 FOR I=0 TO 255
80 LPRINT CHR$(I);
90 NEXT I
100 REM SELECT 240 DOTS PER INCH, AND PRINT 256 ASCENDING BYTES
110 LPRINT
120 LPRINT "240 DPI"
130 LPRINT CHR$(27);"G";"999";"0256";
140 FOR I=0 TO 255
150 LPRINT CHR$(I);
160 NEXT I
170 REM SELECT 80 DOTS PER INCH, AND PRINT 2-INCH SOLID BAR
180 LPRINT
190 LPRINT "80 DPI"
200 LPRINT CHR$(27);"G";"080";"0160";
210 FOR I=1 TO 160
220 LPRINT CHR$(255);
230 NEXT I
240 POKE &HF418,0
250 END

```



60 DPI

240 DPI

80 DPI

46. **ESC S mmmm ...**

**(27 83 mmmm ...) Decimal**  
**(1B 53 mmmm ...) Hexadecimal**

This command prints graphic data in a manner similar to the ESC G command described above, except that the horizontal density depends on the currently selected print mode (character pitch). Horizontal density corresponds to print mode as follows.

Character pitch	Density	Max. dots/line
Pica (10 cpi)	80 dots/inch	640
Elite (12 cpi)	96 dots/inch	768
Condensed (17 cpi)	136 dots/inch	1088
Proportional	90 dots/inch	720

The mmmm parameter and the contents of the graphic data bytes are specified in the same manner as for the ESC G command described above.

```
10 REM PRINT GRAPHIC DATA (ESC S ...)
20 REM TO SUPPRESS THE GENERATION OF TABS BY THE MSX SYSTEM
30 POKE &HF418,1
40 REM PRINT 256 ASCENDING BYTES AT DEFAULT PITCH (10 PCI)
50 LPRINT CHR$(27);"S";"0256";
60 FOR I=0 TO 255
70 LPRINT CHR$(I);
80 NEXT I
90 LPRINT
100 POKE &HF418,0
110 END
```

~~~~~

## Special Symbol Print Function

47. 

|     |   |
|-----|---|
| SOH | n |
|-----|---|

**(01 n) Decimal    (01 n) Hexadecimal**

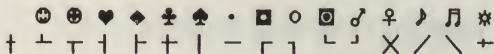
This command causes the printer to print one special symbol. The special symbol is specified by the `n` parameter, which is a number from 64 to 95 (40 to 5F hexadecimal). These codes normally specify characters, but when preceded by the SOH (01) code, they correspond to various graphic symbols. Refer to the table below for codes and symbols.

Note that if n is specified as 32 (20 hexadecimal) or 64 (40 hexadecimal), a space will be printed.

```

10 REM PRINT SPECIAL GRAPHIC SYMBOLS (SOH-ASCII CODE 01)
20 OPEN "LPT:" AS #1
30 FOR I=64 TO 79
40 PRINT #1,CHR$(1);CHR$(I);" ";
50 NEXT I
60 PRINT #1,
70 FOR I=80 TO 95
80 PRINT #1,CHR$(1);CHR$(I);" ";
90 NEXT I
100 CLOSE
110 END

```



## Underline Function

These two commands are used to turn the underline function on and off. Graphic data (including special symbols) is not underlined, nor are spaces, including those skipped due to a horizontal tab.

48. ESC X

**(27 88) decimal    (1B 58) Hexadecimal**

This command selects the underlining function.

49. ESC Y

**(27 89) Decimal    (1B 59) Hexadecimal**

This command cancels the underlining function.

```

10 REM UNDERLINING (ESC X,  ESC Y)
20 OPEN "LPT:" AS #1
30 PRINT #1,CHR$(27);"X";
40 PRINT #1,"USE ESC X COMMAND TO START UNDERLINING";
50 PRINT #1,CHR$(27);"Y";
60 PRINT #1,"AND USE THE ESC Y COMMAND STOP."
70 CLOSE
80 END

```

USE ESC X COMMAND TO START UNDERLINING, AND USE THE ESC Y COMMAND STOP.



## Backspace

### 50. **BS**

#### (08) Decimal (08) Hexadecimal

This command causes the print head to move one space to the left. The next character will be overprinted.

```
10 REM BACKSPACE (BS-ASCII CODE 08)
20 OPEN "LPT:" AS #1
30 PRINT #1,"=";
40 PRINT #1,CHR$(8);
50 PRINT #1,"/"
60 CLOSE
70 END
```

≠

## Character Set Selection Commands

These two commands are used to select character sets. In MSX mode, there are two character sets that can be used: MSX and PRESTEL. Refer to Appendix C for character set tables and page 43 for Dip Switch Settings.

### 51. **ESC \$**

#### (27 36) Decimal (1B 24) Hexadecimal

This command selects the MSX character set.

### 52. **ESC &**

#### (27 38) Decimal (1B 26) Hexadecimal

This command selects the PRESTEL character set. The selected country version is depending on the Dip Switch Settings (See page 43).

```
10 REM CHARACTER SET SELECTION (ESC $, ESC &)
20 OPEN "LPT:" AS #1
30 PRINT #1,"MSX CHARACTER SET CODE 35 IS      ";CHR$(35)
40 REM SELECT PRESTEL CHARACTER SET
50 PRINT #1,CHR$(27);"&";
60 PRINT #1,"PRESTEL CHARACTER SET CODE 35 IS  ";CHR$(35)
70 REM SELECT MSX CHARACTER SET
80 PRINT #1,CHR$(27);"$";
90 PRINT #1,"MSX CHARACTER SET CODE 35 IS      ";CHR$(35)
100 CLOSE
110 END
```

```
MSX CHARACTER SET CODE 35 IS      #
PRESTEL CHARACTER SET CODE 35 IS  £
MSX CHARACTER SET CODE 35 IS      #
```

# IBM, EPSON, AND PRESTEL CONTROL CODES

This section describes the control codes that are effective when the printer is in the IBM, EPSON, and PRESTEL operation modes. Because the commands used in these modes are by and large the same, they are described together. When a code has different effects in different modes, this is explicitly noted in the text.

The command set used in EPSON mode is that for the EPSON FX.

The programme examples are for use with an IBM PC.

## Print Commands

These six commands initiate actual printing of a preceding string of character data.

### 1. CR

#### (13) Decimal (0D) Hexadecimal

Input of this code initiates printing. If DIP switch 1-7 is set to ON, a linefeed is performed after printing. (In IBM mode, the ESC 5 n command can also determine whether or not a linefeed is appended.) If no print data has been input, or if the input data is all space codes, the print head does not move. Subsequent print data starts at the left margin.

In EPSON and PRESTEL modes, this command terminates double-width printing that was started with the SO or ESC SO codes only if a linefeed is appended (i.e. DSW 1-7 is ON). In IBM mode, a CR code always terminates such double-width printing.

```
10 REM CARRIAGE RETURN (CR)
20 REM THIS COMMAND INITIATES PRINTING AND RETURN
30 REM PRINT HEAD TO LEFT COLUMN
40 OPEN "LPT1:" AS #1
50 WIDTH #1,255
60 FOR I=1 TO 3
70 PRINT #1,"PRINT AND..." ;CHR$(13);
80 PRINT #1,"          RETURN";CHR$(13);
90 NEXT I
100 END
```

PRINT AND...RETURN

### 2. LF

#### (10) Decimal (0A) Hexadecimal

This code has the same effect as the CR code, except that a linefeed is always performed. This command terminates double-width printing that was started with the SO or ESC SO codes.

```
10 REM LINEFEED (LF)
20 REM THIS COMMAND INITIATES PRINTING AND
30 REM FEEDS THE PAPER ONE LINE
40 OPEN "LPT1:" AS #1
50 WIDTH #1,255
```



```

60 FOR I=1 TO 3
70 PRINT #1,"LINE ";I;CHR$(10);
80 PRINT #1,"NEXT LINE";CHR$(10);
90 NEXT I
100 END

```

```

LINE 1
NEXT LINE
LINE 2
NEXT LINE
LINE 3
NEXT LINE

```

### 3. **FF**

#### (12) Decimal (0C) Hexadecimal

Input of this code initiates printing, and causes the printer to perform linefeeds until the top of the next page is reached.

The form-feed value (page length) at power-on is either 11 or 12 inches, depending on the setting of DIP switch 1-6. This value can be changed by the ESC C command.

The FF code terminates double-width printing that was started by the SO or ESC SO codes.

```

10 REM FORM FEED (FF)
20 REM THIS COMMAND FEEDS THE PAPER
30 REM TO THE NEXT TOP OF FORM POSITION
40 OPEN "LPT1:" AS #1
50 WIDTH #1,255
60 REM SET PAGE LENGTH TO 2 INCHES
70 PRINT #1,CHR$(27);"C";CHR$(0);CHR$(2);
80 PRINT #1,"THIS IS THE TOP OF PAGE 1";CHR$(10);
90 PRINT #1,"THE DOT MATRIX PRINTER";CHR$(10);
100 REM USE FF TO FEED TO THE NEXT TOP OF FORM
110 PRINT #1,CHR$(12);
120 PRINT #1,"THIS IS THE TOP OF PAGE 2";CHR$(10);
130 PRINT #1,CHR$(12);
140 PRINT #1,"THIS IS THE TOP OF PAGE 3";CHR$(10);
150 END

```

```

THIS IS THE TOP OF PAGE 1
THE DOT MATRIX PRINTER

```

```

THIS IS THE TOP OF PAGE 2

```

```

THIS IS THE TOP OF PAGE 3

```

#### 4. VT

### (11) Decimal (0B) Hexadecimal

Input of this code initiates printing, and causes the printer to perform linefeeds until the paper reaches the next vertical tab position. Vertical tabs are set by the ESC B or ESC b commands. (The ESC b command is not valid in IBM mode.) If no vertical tabs are set, this command has the same effect as the LF code. If at least one tab is set, but there are no more tabs set on the current page, the VT code has the same effect as the FF code.

The VT code terminates double-width printing that was started by the SO or ESC SO codes.

```
10 REM VERTICAL TAB    (VT/ESC,B,n1...nK,0)
20 REM THIS COMMAND EXECUTES VERTICAL TABULATION
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 REM SET PAGE LENGTH TO 3 INCHES
60 PRINT #1,CHR$(27);"C";CHR$(0);CHR$(3);
70 REM SET VERTICAL TABS AT LINE 2, 11, AND 13
80 PRINT #1,CHR$(27);"B";CHR$(1);CHR$(10);CHR$(12);CHR$(0);
90 FOR I=1 TO 2
100 PRINT #1,"LINE 0";CHR$(11);
110 PRINT #1,"LINE 1";CHR$(11);
120 PRINT #1,"LINE 10";CHR$(11);
130 PRINT #1,"LINE 12";CHR$(11);
140 NEXT I
150 END
```

LINE 0  
LINE 1

LINE 10

LINE 12

LINE 0  
LINE 1

LINE 10

LINE 12



## 5. ESC J n

### (27 74 n) Decimal (1B 4A n) Hexadecimal

Input of this command initiates printing and causes the printer to execute one linefeed of n/144 or n/216 inches. n is an eight-bit binary code with a decimal value between 0 and 255. Whether the linefeed is n/144 or n/216 inch can be designated by the GS n command. The default is n/216 inch.

In IBM mode, subsequent print data is printed from the left margin. In EPSON mode, it starts from the next character position in the new line.

This command (3 bytes) is ignored in PRESTEL mode.

```

10 REM PROGRAMMABLE LINEFEED (ESC,J,n)
20 REM N/144 OR N/216 INCH LINEFEED
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 FOR I=1 TO 5
60 PRINT #1,"36/216 INCH LINE FEED"
70 PRINT #1,CHR$(27);"J";CHR$(36);
80 NEXT I
90 PRINT #1,CHR$(10);
100 REM SET 36/144 INCH LINE FEED
110 PRINT #1,CHR$(29);CHR$(1);
120 FOR I=1 TO 5
130 PRINT #1,"36/144 INCH LINE FEED"
140 PRINT #1,CHR$(27);"J";CHR$(36);
150 NEXT I
160 PRINT #1,CHR$(10);
170 REM SET 36/216 INCH LINEFEED AGAIN
180 PRINT #1,CHR$(29);CHR$(0);
190 FOR I=0 TO 5
200 PRINT #1,"36/216 INCH LINE FEED"
210 PRINT #1,CHR$(27);"J";CHR$(36);
220 NEXT I
230 PRINT #1,CHR$(10);
240 CLOSE
250 END

```

```

36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED

```

```

36/144 INCH LINE FEED
36/144 INCH LINE FEED
36/144 INCH LINE FEED
36/144 INCH LINE FEED
36/144 INCH LINE FEED

```

```

36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED
36/216 INCH LINE FEED

```

## 6. ESC j n

### (27 106 n) Decimal (1B 6A n) Hexadecimal

Input of this command initiates printing and causes the printer to execute one reverse linefeed of  $n/144$  or  $n/216$  inches.  $n$  is an eight-bit binary code with a decimal value between 0 and 255. Whether the reverse linefeed is  $n/144$  or  $n/216$  inch can be designated by the GS  $n$  command. The default is for  $n/216$  inch.

In IBM mode, subsequent print data is printed from the left margin. In EPSON mode, it starts from the next character position in the new line.

This command (3 bytes) is ignored in PRESTEL mode.

```
10 REM PROGRAMMABLE REVERSE LINEFEED (ESC,j,n)
20 REM THIS EXAMPLE DEFAULTS TO N/216 INCH REVERSE LINEFEED
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 FOR I=1 TO 12:PRINT #1,CHR$(10);:NEXT I
60 FOR I=20 TO 180 STEP 40
70 PRINT #1,"LF";I;"n/216"CHR$(34);
80 PRINT #1,CHR$(27);"j";CHR$(I);
90 NEXT I
100 PRINT #1,CHR$(10);
110 END
```

LF 180 n/216"

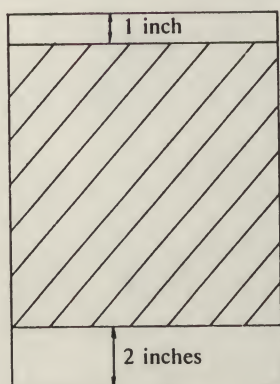
LF 140 n/216"

LF 100 n/216"

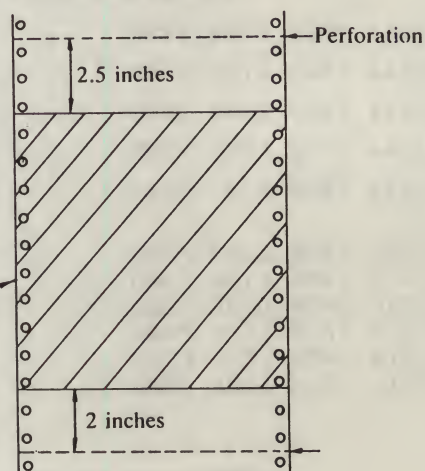
LF 60 n/216"

**Note:** Reverse linefeeds can only be performed in the areas that are hatched in the illustration below. When the tractor unit is being used to feed continuous (fanfold) forms, a maximum of two reverse linefeeds can be performed in this area.

#### • Cut Sheet



#### • Continuous Forms





## Character Mode Designation

These commands designate the character pitch, and various attributes of printed characters.

### 7. **ESC P**

#### (27 80) Decimal (1B 50) Hexadecimal

This command terminates the Elite character pitch.

### 8. **ESC M**

#### (27 77) Decimal (1B 4D) Hexadecimal

This command designates the Elite character pitch.

```
10 REM SELECT PICA/ELITE PITCHES
20 REM PICA (ESC,P) ELITE (ESC,M)
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 REM SELECT PICA PITCH BY DEFAULT
60 PRINT #1,"THIS IS A PRINT SAMPLE - 10 CPI";CHR$(10);
70 REM SELECT ELITE PITCH
80 PRINT #1,CHR$(27);"M";
90 PRINT #1,"THIS IS A PRINT SAMPLE - 12 CPI";CHR$(10);
100 REM RESELECT PICA PITCH
110 PRINT #1,CHR$(27);"P";
120 PRINT #1,"THIS IS A PRINT SAMPLE - 10 CPI";CHR$(10);
130 CLOSE
140 END
```

```
THIS IS A PRINT SAMPLE - 10 CPI
THIS IS A PRINT SAMPLE - 12 CPI
THIS IS A PRINT SAMPLE - 10 CPI
```

### 9. **SI**

#### (15) Decimal (0F) Hexadecimal

This command designates the Condensed character pitch (Condensed Pica or Condensed Elite).

```
10 REM CONDENSED CHARACTERS (SI OR ESC,SI)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET CONDENSED PICA
50 PRINT #1,CHR$(15);
60 PRINT #1,"CONDENSED PICA - 17 CPI";CHR$(10);
70 REM SELECT ELITE PITCH
80 PRINT #1,CHR$(27);"M";
90 PRINT #1,"CONDENSED ELITE - 20 CPI";CHR$(10);
100 PRINT#1,CHR$(27);"P";CHR$(18);CHR$(10);
110 PRINT #1,"ASCII IS (DC2) RELEASES CONDENSED PRINT "
120 PRINT #1,CHR$(10)
130 CLOSE
140 END
```

```
CONDENSED PICA - 17 CPI
CONDENSED ELITE - 20 CPI
```

```
ASCII IS (DC2) RELEASES CONDENSED PRINT
```

### 10. **ESC SI**

#### (27 15) Decimal (1B 0F) Hexadecimal

This command has the same effect as the SI command. (See above.)

11. **DC 2**

**(18) Decimal (12) Hexadecimal**

This command terminates the Condensed character pitch designated by the SI or ESC SI commands. (Refer to 9.)

12. **ESC x 1 (or (1))**

**(27 120 49 or 1) Decima  
(11B 78 31 or 01) Hexadecimal**

This command designates the Letter-quality print mode. In this mode, characters are printed more clearly (and more slowly) than in normal standard (Draft) mode. While this mode is designated, the LQ lamp on the front panel is lit.

If this command is executed while the Condensed character pitch (Pica or Elite) is designated, the LQ lamp lights, but characters are printed in Draft mode. If Condensed character pitch is then terminated, characters are printed in LQ print mode.

13. **ESC x 0 (or (0))**

**(27 120 48 or 0) Decimal  
(1B 78 30 or 00) Hexadecimal**

This command terminates the Letter-quality print mode, returns the printer to Draft mode, and causes the LQ lamp on the front panel to go out.

```
10 REM SELECT LQ FONT
20 REM THIS COMMAND CONTROLS THE LQ LED
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,"Print sample in draft Pica";CHR$(10);
60 PRINT #1,CHR$(27);"x";CHR$(1);
70 PRINT #1,"Print sample in LQ Pica";CHR$(10);
80 REM RELEASE LQ
90 PRINT #1,CHR$(27);"x";CHR$(0);
100 PRINT #1,CHR$(27);"M";
110 PRINT #1,"Print sample in draft Elite";CHR$(10);
120 PRINT #1,CHR$(27);"x";CHR$(1);
130 PRINT #1,"Print sample in LQ Elite";CHR$(10);
140 PRINT #1,CHR$(27);"x";CHR$(0);
150 CLOSE
160 END
```

```
Print sample in draft Pica
Print sample in LQ Pica
Print sample in draft Elite
Print sample in LQ Elite
```

14. **ESC p 1 (or (1))**

**(27 112 49 or 1) Decimal  
(1B 70 31 or 01) Hexadecimal**

This command designates Proportional character pitch, in which different characters have different widths (e.g. a "W" is wider than an "i"). Note that with Proportional spacing, the widths and spacing of some characters differ between Draft mode and LQ mode. The BS and DEL codes are ignored while Proportional character pitch is designated.



15. 

|     |   |            |
|-----|---|------------|
| ESC | p | 0 (or (0)) |
|-----|---|------------|

 (27 112 48 or 0) Decimal  
(1B 70 31 or 00) Hexadecimal

This command terminates Proportional character pitch.

```
10 REM SELECT PROPORTIONAL SPACING (ESC,p,1)
20 REM SPACING BETWEEN CHARACTERS IS PROPORTIONAL
30 REM TO THE SIZE OF THE CHARACTER
40 OPEN "LPT1:" AS #1
50 WIDTH #1,255
60 PRINT #1,"Sample printout in draft Pica";CHR$(10);
70 REM SELECT PROPORTIONAL SPACING
80 PRINT #1,CHR$(27);"p";CHR$(1);
90 PRINT #1,"Sample printout with Proportional Spacing";CHR$(10);
100 PRINT #1,CHR$(27);"p";CHR$(0);
110 PRINT #1,CHR$(27);"x";CHR$(1);
120 PRINT #1,"Sample printout in LQ Pica";CHR$(10);
130 PRINT #1,CHR$(27);"p";CHR$(1);
140 PRINT #1,"Sample printout with LQ and Proportional Spacing";CHR$(10);
150 PRINT #1,CHR$(27);"p";CHR$(0);CHR$(27);"x";CHR$(0)
160 CLOSE
170 END
```

Sample printout in draft Pica  
Sample printout with Proportional Spacing  
Sample printout in LQ Pica  
Sample printout with LQ and Proportional Spacing

16. 

|     |   |            |
|-----|---|------------|
| ESC | S | 0 (or (0)) |
|-----|---|------------|

 (27 83 48 or 0) Decimal  
(1B 53 30 or 00) Hexadecimal

This command designates the Superscript character mode.

17. 

|     |   |            |
|-----|---|------------|
| ESC | S | 1 (or (1)) |
|-----|---|------------|

 (27 83 49 or 1) Decimal  
(1B 53 31 or 01) Hexadecimal

This command designates the Subscript character mode.

**18. ESC T****(27 84) Decimal (1B 54) Hexadecimal**

This command terminates the Superscript/Subscript character mode. In Superscript/Subscript character mode, characters are reduced to 1/2 their normal height, and are the same in both Draft and LQ print modes. If Proportional character pitch is selected together with Superscript/Subscript, characters have the same widths and spacing as in Draft mode. Thus, if both Superscript/ Subscript and Proportional character spacing are designated while in LQ print mode, the widths and spacing of characters will be slightly different from what they would be if Superscript/ Subscript character mode were not selected.

```
10 REM SUBSCRIPT (ESC,S,1) AND SUPERScript (ESC,S,0)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"S";CHR$(1);
50 PRINT #1,"Subscript";
60 PRINT #1,CHR$(27);"T";
70 PRINT #1,"Draft Pica";
80 PRINT #1,CHR$(27);"S";CHR$(0);
90 PRINT #1,"Superscript";CHR$(10);
100 CLOSE
110 END
```

*SubscriptDraft PicaSuperscript*

**19. ESC 4****(27 52) Decimal (1B 34) Hexadecimal**

This command designates the Italic character mode. All character data received by the printer after this command is printed in italic form. This command is ignored during the printing of graphic data.

This command (2 bytes) is ignored in IBM mode.

**20. ESC 5****(27 53) Decimal (1B 35) Hexadecimal**

This command terminates the Italic character mode.

This command is (2 bytes) ignored in IBM mode.

```
10 REM ITALIC CHARACTER (ESC,4)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"4";
50 PRINT #1,"ITALIC CHARACTER";CHR$(10);
60 PRINT #1,CHR$(27);"5";
70 PRINT #1,"DRAFT PICA CHARACTER"
80 CLOSE
90 END
```

*ITALIC CHARACTER*  
*DRAFT PICA CHARACTER*



## 21. ESC ! n

### (27 33 n) Decimal (1B 21 n) Hexadecimal

This command designates mixed modes (combinations) of the Elite, Proportional, Condensed, Bold, Double-strike, Double-width, and Underline print modes. When the printer receives this command, all previously set modes except for LQ and Superscript/Subscript are cleared and replaced with the new settings.

The n parameter is a binary number that specifies which of the modes are to be designated. Bits correspond to modes as shown below. To designate the mode in question, set the value of the appropriate bit to 1.

| Bit     | Mode              |
|---------|-------------------|
| 7 (MSB) | Underline         |
| 6       | Italic            |
| 5       | Double-width      |
| 4       | Double-strike     |
| 3       | Bold (Emphasised) |
| 2       | Condensed         |
| 1       | Proportional      |
| 0 (LSB) | Elite             |

## Bold (Emphasised) Characters

## 22. ESC E

### (27 69) Decimal (1B 45) Hexadecimal

This command designates the Bold (Emphasised) character mode. In this mode, each character is printed once, then the print head moves one-half dot to the right, and the character is printed again.

If the Bold character mode is designated together with the Condensed Pica (17 cpi) character pitch, Bold Pica (10 cpi) characters are printed. (This is true even when the Condensed character pitch is selected using the switches on the front panel.) In this case, the Condensed character pitch will be restored when the Bold mode is terminated by the ESC F command.

## 23. ESC F

### (27 70) Decimal (1B 46) Hexadecimal

This command terminates the Bold character mode.

```

10 REM EMPHASIS PRINTING (ESC, E)
11 REM SINGLE PASS PRINTING
20 OPEN "LPT1:" AS #1
30 WIDTH #1, 255
40 PRINT #1, CHR$(27); "E";
50 PRINT #1, "BOLD (EMPHASIZED) PRINTING"; CHR$(10);
60 PRINT #1, CHR$(27); "F";
70 PRINT #1, "NORMAL PRINTING "
80 CLOSE
90 END

```

BOLD (EMPHASIZED) PRINTING  
NORMAL PRINTING

## Double-strike Characters

### 24. **ESC G**

#### (27 71) Decimal (1B 47) Hexadecimal

This command designates the Double-strike character mode. In this mode, each character is printed once, the paper is advanced 1/144 inch, the character is printed again, and the paper is returned to its original position.

The Superscript/Subscript and LQ modes have priority over the Double-strike mode, and Double-strike mode is ignored while either of the higher-priority modes is designated. If the higher-priority mode is terminated, the designation of the Double-strike mode becomes effective.

### 25. **ESC H**

#### (27 72) Decimal (1B 48) Hexadecimal

This command terminates the Double-strike character mode.

```
10 REM DOUBLE STRIKE PRINTING (ESC,G)
20 REM DOUBLE PASS PRINTING
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,CHR$(27);"G";
60 PRINT #1,"DOUBLE STRIKE PRINTING";CHR$(10);
70 PRINT #1,CHR$(27);"H";
80 PRINT #1,"NORMAL PRINTING "
90 CLOSE
100 END
```

```
DOUBLE STRIKE PRINTING
NORMAL PRINTING
```

## Double-width Characters

### 26. **SO**

#### (14) Decimal (0E) Hexadecimal

This command designates the Double-width character mode. If more character data than can fit on a single line are input, printing is initiated, a linefeed is executed, and the mode is terminated. This mode is also terminated by the DC4 or ESC W n commands, and by any linefeed command other than ESC J n or ESC j n.

This command has no effect on the printing of graphic data.

### 27. **ESC SO**

#### (27 14) Decimal (1B 0E) Hexadecimal

This command has the same effect as the SO command. (See above.)



**28. DC4****(20) Decimal (14) Hexadecimal**

This command terminates the Double-width character mode designated by SO or ESC SO.

```

10 REM SINGLE-LINE DOUBLE WIDTH CHARACTERS (SO)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(14);
50 PRINT #1,"DOUBLE";CHR$(20);"    NORMAL    ";
60 PRINT #1,CHR$(14);"WIDTH";CHR$(10);
70 PRINT #1,"DOUBLE WIDTH SET BY <SO> IS CLEARED"
80 PRINT #1,CHR$(10);
90 PRINT #1,"BY EITHER DC4 OR A LF"
100 PRINT #1,CHR$(10);
110 PRINT #1,"--THE <SO> AND <ESC,SO> COMMAND ARE THE SAME "
120 CLOSE
130 END

```

```

DOUBLE    NORMAL    WIDTH
DOUBLE WIDTH SET BY <SO> IS CLEARED
BY EITHER DC4 OR A LF
--THE <SO> AND <ESC,SO> COMMAND ARE THE SAME

```

**29. ESC W 1 (or (1))****(27 87 49 or 1) Decimal****(1B 57 31 or 01) Hexadecimal**

This command designates the Double-width character mode. This mode differs from that specified by SO or ESC SO in that it is not terminated by a linefeed.

**30. ESC W 0 (or (0))****(27 87 48 or 0) Decimal****(1B 57 31 or 00) Hexadecimal**

This command terminates the Double-width character mode, regardless of whether it was designated by SO, ESC SO, or ESC W 1.

```

10 REM DOUBLE WIDTH CHARACTERS (ESC,W,1)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"W";CHR$(1);
50 PRINT #1,"DOUBLE WIDTH IS NOT CANCELLED"CHR$(10);
60 PRINT #1,"BY A LINE FEED --";CHR$(10);
70 PRINT #1,CHR$(27);"W";CHR$(0);
80 PRINT #1,"BUT IS RELEASED BY <ESC,W,0>"
90 CLOSE
100 END

```

```

DOUBLE WIDTH IS NOT CANCELLED
BY A LINE FEED --
BUT IS RELEASED BY <ESC,W,0>

```

# Graphic Mode

In the various graphic print modes, it is possible to directly print patterns rather than just character data.

31. ESC K n1 n2 ...

(27 75 n1 n2 ...) Decimal  
(1B 4B n1 n2 ...) Hexadecimal

This command designates standard-density (60 dpi) graphic printing. n1 and n2 are binary numbers that indicate the number of following data bytes to be interpreted as graphic data. n1 is the low-order byte, and n2 is the high-order byte, so that the total number of bytes equals  $(n2 \times 256) + n1$ . After printing the specified number of bytes of graphic data, the printer is restored to the state that it was in before graphic printing was designated (i.e. the previous character pitch, margins, etc. remain valid).

Each byte of graphic data specifies the dot pattern of a single eight-dot column, and each of these columns corresponds to one horizontal dot. The maximum number of horizontal dots per line is 480. If n1 and n2 specify a number greater than this maximum, the excess data is ignored.

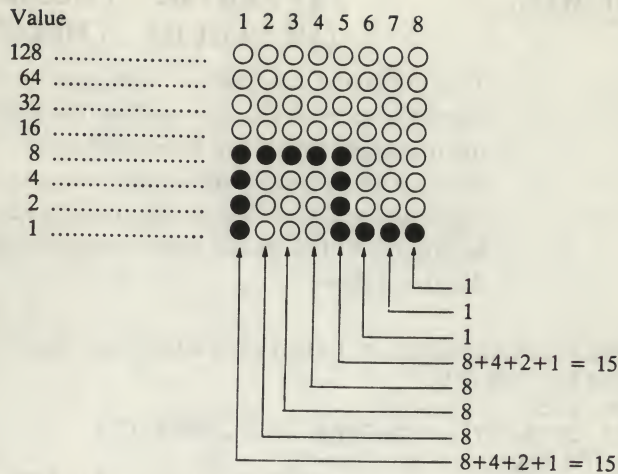
Each byte of graphic data consists of eight bits, which correspond to individual dots in the vertical direction. The top dot in each column is specified by the most-significant-bit (MSB) of the byte. Refer to the chart below.

| Dot | Value               |
|-----|---------------------|
| •   | 128 (MSB, top dot)  |
| •   | 64                  |
| •   | 32                  |
| •   | 16                  |
| •   | 8                   |
| •   | 4                   |
| •   | 2                   |
| •   | 1 (LSB, bottom dot) |

To specify that a dot should be printed, include the value for that dot in the total value of the graphic data byte. For example, to print only the top two dots in a column, add  $128 + 64 = 192$ , and specify 192 as the value of the graphic data byte. Likewise, to print all dots in a column, add  $128 + 64 + 32 + 16 + 8 + 4 + 2 + 1 = 255$ , and specify 255 as the value of the graphic data byte.

In graphic mode, it is useful to send the ESC A 8 command to the printer, to set a 8/72 (1/9) inch linefeed. This makes patterns on consecutive lines appear continuous. (The ESC A n command is ignored in PRESTEL mode.)





```

10 REM STANDARD DENSITY GRAPHICS (ESC,K,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"K";CHR$(160);CHR$(0);
50 FOR J=1 TO 20
60 PRINT #1,CHR$(15);CHR$(8);CHR$(8);CHR$(8);CHR$(15);
70 PRINT #1,CHR$(1);CHR$(1);CHR$(1);
80 NEXT J
90 PRINT #1,CHR$(10);
100 CLOSE
110 END

```

~~~~~

## 32. | | | | | | |-----|---|----|----|-----| | ESC | L | n1 | n2 | ... | |-----|---|----|----|-----| (27 76 n1 n2 ...) Decima (1B 4C n1 n2 ...) Hexadecimal

This command designates double-density (120 dpi) graphic printing. The print speed is one-half that of standard-density graphic printing, and the maximum number of horizontal dots per line is 960. Otherwise, this command is the same as the ESC K command discussed above.

```

10 REM DOUBLE SPEED DOUBLE DENSITY GRAPHICS (ESC,Y,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"Y";CHR$(160);CHR$(0);
50 FOR J=1 TO 20
60 PRINT #1,CHR$(15);CHR$(8);CHR$(8);CHR$(8);CHR$(15);
70 PRINT #1,CHR$(1);CHR$(1);CHR$(1);
80 NEXT J
90 PRINT #1,CHR$(10);
100 CLOSE
110 END

```

~~~~~

33. 

|     |   |    |    |     |
|-----|---|----|----|-----|
| ESC | Y | n1 | n2 | ... |
|-----|---|----|----|-----|

(27 89 n1 n2 ...) Decimal  
(1B 59 n1 n2 ...) Hexadecimal

This command designates double-speed, double-density graphic printing. The print speed is the same as that of standard-density graphic printing, and the maximum number of horizontal dots is 960. (However, horizontally adjacent dots are not printed, so the maximum number of dots in a single row is actually 480. This has no effect on the maximum number of bytes that can be specified.) Otherwise, this command is the same as the ESC K command discussed above.

```
10 REM DOUBLE SPEED DOUBLE DENSITY GRAPHICS (ESC,Y,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"Y";CHR$(160);CHR$(0);
50 FOR J=1 TO 20
60 PRINT #1,CHR$(15);CHR$(8);CHR$(8);CHR$(8);CHR$(15);
70 PRINT #1,CHR$(1);CHR$(1);CHR$(1);
80 NEXT J
90 PRINT #1;CHR$(10);
100 CLOSE
110 END
```

~~~~~

34. 

ESC	Z	n1	n2	...
-----	---	----	----	-----

(27 90 n1 n2 ...) Decimal  
(1B 5A n1 n2 ...) Hexadecimal

This command designates quadruple-density graphic printing. The print speed is the same as that of double-density graphic printing, and the maximum number of horizontal dots is 1920. (However, horizontally adjacent dots are not printed, so the maximum number of dots in a single row is actually 960. This has no effect on the maximum number of bytes that can be specified.) Otherwise, this command is the same as the ESC K command discussed above.

```
10 REM QUADRUPLE DOUBLE DENSITY GRAPHICS (ESC,Z,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"Z";CHR$(160);CHR$(0);
50 FOR J=1 TO 20
60 PRINT #1,CHR$(15);CHR$(8);CHR$(8);CHR$(8);CHR$(15);
70 PRINT #1,CHR$(1);CHR$(1);CHR$(1);
80 NEXT J
90 PRINT #1,CHR$(10);
100 CLOSE
110 END
```

~~~~~



35. 

|     |   |   |    |    |     |
|-----|---|---|----|----|-----|
| ESC | * | m | n1 | n2 | ... |
|-----|---|---|----|----|-----|

(27 42 m n1 n2 ...) Decimal  
(1B 2A m n1 n2 ...) Hexadecimal

This command designates graphic printing in one of eight possible modes. The mode is specified by the m parameter, which is a one-digit number between 0 and 7. (If n > 7, five bytes, starting with the ESC code, are ignored, and following bytes are interpreted as character data.) The n1 and n2 parameters, and the graphic data bytes themselves, are specified in the same manner as for the ESC K command discussed above.

The m parameter corresponds to graphic printing modes as shown in the table below. The table also shows the maximum number of dots per line and the dot spacing for each mode.

| m | Graphic Type                        | 1 Line Dot Number (8 inch) | Horizontal Dot Spacing | Vertical: Horizontal | Equivalent Commands |
|---|-------------------------------------|----------------------------|------------------------|----------------------|---------------------|
| 0 | Standard-density Graphic            | 480 dots                   | 1/60 inch              | 1:1.2                | ESC, K              |
| 1 | Double-density Graphic              | 960 dots                   | 1/120 inch             | 1:0.6                | ESC, L              |
| 2 | Double-speed Double-density Graphic | 960 dots                   | 1/120 inch             | 1:0.6                | ESC, Y              |
| 3 | Quadruple-density Graphic           | 1920 dots                  | 1/240 inch             | 1:0.3                | ESC, Z              |
| 4 | 640 Dot Graphic                     | 640 dots                   | 1/80 inch              | 1:0.9                | —                   |
| 5 | 576 Dot Graphic                     | 576 dots                   | 1/72 inch              | 1:1                  | —                   |
| 6 | 720 Dot Graphic                     | 720 dots                   | 1/90 inch              | 1:0.8                | —                   |
| 7 | 1152 Dot Graphic                    | 1152 dots                  | 1/144 inch             | 1:0.5                | —                   |

```

10 REM 8-PIN GRAPHICS MODE (ESC, Z, n1, n2)
20 REM SELECTS 8 DIFFERENT GRAPHICS DENSITIES
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 FOR M=0 TO 7
60 PRINT #1," (MODE m = ";M;" ) ";
70 PRINT #1,CHR$(27);"*";CHR$(M);CHR$(160);CHR$(0);
80 FOR J=1 TO 20
90 PRINT #1,CHR$(15);CHR$(8);CHR$(8);CHR$(8);CHR$(15);
100 PRINT #1,CHR$(1);CHR$(1);CHR$(1);
110 NEXT J
120 PRINT #1,CHR$(10);
130 NEXT M
140 CLOSE
150 END

```

|               |  |
|---------------|--|
| (MODE m = 0 ) |  |
| (MODE m = 1 ) |  |
| (MODE m = 2 ) |  |
| (MODE m = 3 ) |  |
| (MODE m = 4 ) |  |
| (MODE m = 5 ) |  |
| (MODE m = 6 ) |  |
| (MODE m = 7 ) |  |


36. 


|     |   |   |    |    |    |    |     |
|-----|---|---|----|----|----|----|-----|
| ESC | ^ | m | n1 | n2 | HB | LB | ... |
|-----|---|---|----|----|----|----|-----|

(27 94 m n1 n2 ...) Decimal  
(1B 5E m n1 n2 ...) Hexadecimal

This command designates the 9-pin graphic mode, in which all nine pins on the print head are used. The m parameter designates the horizontal density: if m = 0, the density is 60 dpi (maximum 480 horizontal dots), and if m = 1, the density is 120 dpi (maximum 960 horizontal dots). Since each dot column consists of nine vertical dots, two bytes are required to define each column. The first byte in each pair (High Byte, HB) specifies the pattern of the top eight dots, and is defined in the same way as with the ESC K command. The MSB of the second byte in each pair (Low Byte, LB) specifies whether or not to print the bottom dot in each column. The lower seven bits of this byte are ignored. Thus, if LB < 128, the bottom dot is not printed, and if LB ≥ 128, the bottom dot is printed. Otherwise, this command is the same as the ESC K command.

```
10 REM 9-PIN GRAPHICS MODE (ESC, ^, a, n1, n2)
20 REM SELECTS 8 DIFFERENT GRAPHICS DENSITIES
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 FOR A=0 TO 1
60 PRINT #1," (MODE a = ";A;" ) ";
70 PRINT #1,CHR$(27);"^";CHR$(A);CHR$(160);CHR$(0);
80 FOR J=1 TO 20
90 PRINT #1,CHR$(15);CHR$(128);CHR$(8);CHR$(128);
100 PRINT #1,CHR$(8);CHR$(128);CHR$(8);CHR$(128);
110 PRINT #1,CHR$(15);CHR$(128);CHR$(1);CHR$(128);
120 PRINT #1,CHR$(1);CHR$(128);CHR$(1);CHR$(128);
130 NEXT J
140 PRINT #1,CHR$(10);
150 NEXT A
160 CLOSE
170 END
```

(MODE a = 0 ) 

(MODE a = 1 ) 

37. 

|     |   |   |   |
|-----|---|---|---|
| ESC | ? | n | m |
|-----|---|---|---|

(27 63 n m) Decimal (1B 3F n m) Hexadecimal

This command changes the functions of the ESC K, ESC L, ESC Y, or ESC Z commands. The command whose function is to be changed is specified by the n parameter (K, L, Y, or Z). The m parameter (0 to 7) specifies which graphic mode is to be designated by the command in question.

| m | Graphic mode                 |
|---|------------------------------|
| 0 | Standard-density             |
| 1 | Double-density               |
| 2 | Double-speed, Double-density |
| 3 | Quadruple-density            |
| 4 | 640 dots/line (80 dpi)       |
| 5 | 576 dots/line (72 dpi)       |
| 6 | 720 dots/line (90 dpi)       |
| 7 | 1152 dots/line (144 dpi)     |



### NORMAL ASSIGNMENT

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

[illegible]

**39. ESC 1****(27 49) Decimal (1B 31) Hexadecimal**

This command designates a linefeed value of 7/72 inch. Subsequent linefeeds (LF, CR) will be 7/72 inch.

This command (2 bytes) is ignored in PRESTEL mode.

```
10 REM SET LINE FEED TO 7/72 INCH (ESC,0)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"1";
50 FOR I=1 TO 6
60 PRINT #1,"7/72 INCH (72/7 LINES PER INCH)";CHR$(10);
70 NEXT I
80 CLOSE
90 END
```

```
7/72 INCH (72/7 LINES PER INCH)
7/72 INCH (72/7 LINES PER INCH)
7/72 INCH (72/7 LINES PER INCH)
7/72 INCH (72/7 LINES PER INCH)
7/72 INCH (72/7 LINES PER INCH)
7/72 INCH (72/7 LINES PER INCH)
```

**40. ESC 2****(27 50) Decimal (1B 32) Hexadecimal**

EPSON mode:

This command designates a linefeed value of 1/6 inch.

IBM mode:

This command causes the printer to execute a linefeed, the pitch of which is set by the ESC A n command (see 42. below).

PRESTEL mode:

This command (2 bytes) is ignored.

```
10 REM SET LINE FEED TO 1/6 INCH (ESC,2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"2";
50 FOR I=1 TO 6
60 PRINT #1,"1/6 INCH (6 LINES PER INCH)";CHR$(10);
70 NEXT I
80 CLOSE
90 END
```

```
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
1/6 INCH (6 LINES PER INCH)
```



**(27 51 n) Decimal    (1B 33 n) Hexadecimal**

This command sets the linefeed value to either n/144 or n/216 inch. Whether the n parameter specifies the linefeed pitch in 1/144-inch or 1/216-inch units is designated by the GS (1) or GS NUL command (see 43. and 44). The power-on default is for units of 1/216 inch.

This command (3 bytes) is ignored in PRESTEL mode.

```

10 REM SET PROGRAMMABLE LINE FEED (ESC,3,n)
20 REM THIS COMMAND CAN ISSUE EITHER A
30 REM n/216 OR n/144 INCH LINE FEED
40 OPEN "LPT1:" AS #1
50 WIDTH #1,255
60 FOR I=0 TO 6
70 PRINT #1,CHR$(27);"3";CHR$(36);
80 PRINT #1,"36/216 INCH LINE FEED WHEN GS COMMAND NOT USED";CHR$(10);
90 NEXT I
100 PRINT #1,CHR$(10);
110 REM SET n/144 INCH MODE USING <GS,01>
120 PRINT #1,CHR$(29);CHR$(1);
130 FOR I=0 TO 6
140 PRINT #1,CHR$(27);"3";CHR$(36);
150 PRINT #1,"36/144 INCH LINE FEED ";CHR$(10);
160 NEXT I
170 PRINT #1,CHR$(10);
180 REM SET n/216 INCH MODE USING <GS,00>
190 PRINT #1,CHR$(29);CHR$(0);
200 FOR I=0 TO 6
210 PRINT #1,CHR$(27);"3";CHR$(36);
220 PRINT #1,"36/216 INCH LINE FEED ";CHR$(10);
230 NEXT I
240 CLOSE
250 END

```

[illegible][illegible][illegible]

**42. ESC A n**

EPSON mode:

**(27 65 n) Decimal (1B 41 n) Hexadecimal**

This command sets the linefeed value to  $n/72$  inch. A linefeed of this pitch will be executed when the printer receives the LF (and in some cases the CR) command.

IBM Mode:

This command sets the linefeed value to  $n/72$  inch. A linefeed of this pitch will be executed when the printer receives the ESC 2 command.

PRESTEL mode:

This command (3 bytes) is ignored.

```
10 REM SET n/72 INCH PROGRAMMABLE LINE FEED (ESC,A,n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 FOR I=0 TO 20
50 PRINT #1,CHR$(27);"A";CHR$(I);
60 PRINT #1,SPC(I);I;" /72 INCH LINE FEED";CHR$(10);
70 NEXT I
80 PRINT #1,CHR$(10);
90 PRINT #1,CHR$(27);"2";
100 CLOSE
110 END
```

```
01234567891011121314151617181920
1 /72 INCH LINE FEED
2 /72 INCH LINE FEED
3 /72 INCH LINE FEED
4 /72 INCH LINE FEED
5 /72 INCH LINE FEED
6 /72 INCH LINE FEED
7 /72 INCH LINE FEED
8 /72 INCH LINE FEED
9 /72 INCH LINE FEED
10 /72 INCH LINE FEED
11 /72 INCH LINE FEED
12 /72 INCH LINE FEED
13 /72 INCH LINE FEED
14 /72 INCH LINE FEED
15 /72 INCH LINE FEED
16 /72 INCH LINE FEED
17 /72 INCH LINE FEED
18 /72 INCH LINE FEED
19 /72 INCH LINE FEED
20 /72 INCH LINE FEED
```

**43. GS (1)****(29 1) Decimal (1D 01) Hexadecimal**

This command specifies that the linefeeds designated by the ESC 3 n, ESC J n, and ESC j n commands will be measured in units of 1/144 inch.

Refer to 5., 6., and 41.

This command (2 bytes) is ignored in PRESTEL mode.

**44. GS (0)****(29 0) Decimal (1D 00) Hexadecimal**

This command specifies that the linefeeds designated by the ESC 3 n, ESC J n, and ESC j n commands will be measured in units of 1/216 inch. (This is the default setting.)

Refer to 5., 6., and 41.

This command (2 bytes) is ignored in PRESTEL mode.



## Page Length

At power-on, the default page length is either 11 or 12 inches, depending on the setting of DIP switch 1-6. There are two commands that can be used to modify this setting. One defines the page length in lines, and the other defines the page length in inches. Both commands clear the perforation skip and vertical tab settings.

45. 

|     |   |   |
|-----|---|---|
| ESC | C | n |
|-----|---|---|

**(27 67 n) Decimal (1B 43 n) Hexadecimal**

This command designates the page length in lines. The *n* parameter is a binary number between 1 and 127. The physical length of the page is calculated in terms of the current linefeed value. (The physical length of the page does not change if the linefeed value is subsequently changed.) If *n* > 128, or designates a page value in excess of 150 inches, this command (3 bytes) is ignored.

The vertical position of the print head on the paper becomes the new top-of-form (TOF) position.

```
10 REM SET PAGE LENGTH IN LINES (ESC,C,n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET PAGE LENGTH OF 5 LINES
50 PRINT #1,CHR$(27);"C";CHR$(5);
60 FOR I=1 TO 2
70 FOR J=1 TO 3
80 PRINT #1,"PAGE ";I;"", LINE ";J;CHR$(10);
90 NEXT J
100 PRINT #1,CHR$(12);
110 NEXT I
120 PRINT #1,"PAGE 3"
130 CLOSE
140 END
```

```
PAGE 1 , LINE 1
PAGE 1 , LINE 2
PAGE 1 , LINE 3
```

```
PAGE 2 , LINE 1
PAGE 2 , LINE 2
PAGE 2 , LINE 3
```

```
PAGE 3
```

**46. ESC C 0 (or 128) n****(27 67 0 (or 128) n) Decimal**  
**(1B 43 00 (or 128) n) Hexadecimal**

This command designates the page length in inches. The n parameter is a binary number between 1 and 22. If n > 22 or n = 0, this command (4 bytes) is ignored.

The vertical position of the print head on the paper becomes the new top-of-form (TOF) position.

```
10 REM SET PAGE LENGTH IN INCHES (ESC, C, 0, n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET PAGE LENGTH OF 1 INCH
50 PRINT #1,CHR$(27);"C";CHR$(0);CHR$(1);
60 FOR I=1 TO 2
70 FOR J=1 TO 3
80 PRINT #1,"PAGE";I,"", LINE "";J;CHR$(10);
90 NEXT J
100 PRINT #1,CHR$(12);
110 NEXT I
120 PRINT #1,"PAGE 3"
130 CLOSE
140 END
```

```
PAGE 1 , LINE 1
PAGE 1 , LINE 2
PAGE 1 , LINE 3
```

```
PAGE 2 , LINE 1
PAGE 2 , LINE 2
PAGE 2 , LINE 3
```

```
PAGE 3
```

**Horizontal Tabs**

At power-on, default tab stops are set in every eighth column. New horizontal tabs can be set by command.

**47. ESC D n1 n2 ... NUL****(27 68 n1 n2 ... 0) Decimal**  
**(1B 44 n1 n2 ... 00) Hexadecimal**

This command designates horizontal tab stops. Tab stops are located in the column positions designated by the (n1 n2 ...) parameters; there can be up to 32 of these parameters, designating 32 horizontal tab positions. Tab positions must be designated in ascending order. The NUL code (00 hexadecimal) terminates the command string.

In EPSON and PRESTEL modes, the physical location of tab stops is calculated according to the current character pitch, and does not change if the character pitch is changed. (If proportional character spacing is designated when this command is executed, columns units are 1/10 inch.) In IBM mode, the physical location of tab stops automatically changes when the character pitch is changed.



```

10 REM HORIZONTAL TAB SETTING (ESC,D,n1...nK,0)
20 REM THE HT COMMAND EXECUTES TAB
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,CHR$(27);"M";
60 PRINT #1,"0123456789111111111122222222223333333333";CHR$(10);
70 PRINT #1,"          012345678901234567890123456789";CHR$(10);
80 REM SET TAB STOPS AT COLUMN 5,10,20 AND 29
90 PRINT #1,CHR$(27);"D";CHR$(5);CHR$(10);CHR$(20);
100 PRINT #1,CHR$(29);CHR$(0);
110 FOR I=1 TO 4
120 REM EXECUTE THE TAB
130 PRINT #1, CHR$(9);"TAB";
140 NEXT I
150 PRINT #1,CHR$(10);
160 CLOSE
170 END

```

```

0123456789111111111122222222223333333333
012345678901234567890123456789
TAB TAB TAB TAB

```

#### 48. HT

#### (9) Decimal (09) Hexadecimal

This command moves the print head over to the next horizontal tab position to the right of the current position.

```

10 REM EXECUTION OF TABS VIA HT (ASCII 9)
20 REM TAB DEFAULTS AT EVERY EIGHT COLUMNS
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,"0123456789111111111122222222223333333333";CHR$(10);
60 PRINT #1,"          012345678901234567890123456789";CHR$(10);
70 FOR I=0 TO 4
80 PRINT #1, CHR$(9);"TAB";
90 NEXT I
100 PRINT #1,CHR$(10);
110 CLOSE
120 END

```

```

0123456789111111111122222222223333333333
012345678901234567890123456789
TAB TAB TAB TAB TAB

```

## Margin Setting

Left and right margins can be set separately, or with a single command.

### 49. | | | | |-----|---|---| | ESC | Q | n | |-----|---|---|

#### (27 81 n) Decimal (1B 51 n) Hexadecimal

This command sets the right margin in the column designated by the n parameter. Column units are calculated in terms of the current character pitch (10 cpi for Proportional character pitch). If the value of the n parameter exceeds the number of columns in a single line, this command (3 bytes) is ignored.

When the printer receives this command, it clears its print buffer.

```
10 REM RIGHT MARGIN SETTINGS (ESC,Q,n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"01234567891111111112222222222333333333";CHR$(10);
50 PRINT #1,"012345678901234567890123456789";CHR$(10);
60 REM RIGHT MARGIN AT 30TH COLUMN
70 PRINT #1,CHR$(10);
80 PRINT #1,"RIGHT MARGIN AT 30TH COLUMN";CHR$(10);
90 PRINT #1,CHR$(27);"Q";CHR$(30);
100 FOR I=1 TO 4:PRINT #1,"0123456789";:NEXT I:PRINT #1,CHR$(10);
110 REM RIGHT MARGIN AT 20TH COLUMN
120 PRINT #1,CHR$(10);
130 PRINT #1,"RIGHT MARGIN AT 20TH COLUMN";CHR$(10);
140 PRINT #1,CHR$(27);"Q";CHR$(20);
150 FOR I=1 TO 4:PRINT #1,"0123456789";:NEXT I:PRINT #1,CHR$(10);
160 CLOSE
170 END
```

```
01234567891111111112222222222333333333
012345678901234567890123456789
```

```
RIGHT MARGIN AT 30TH COLUMN
012345678901234567890123456789
0123456789
```

```
RIGHT MARGIN AT 20TH COLUMN
01234567890123456789
01234567890123456789
```

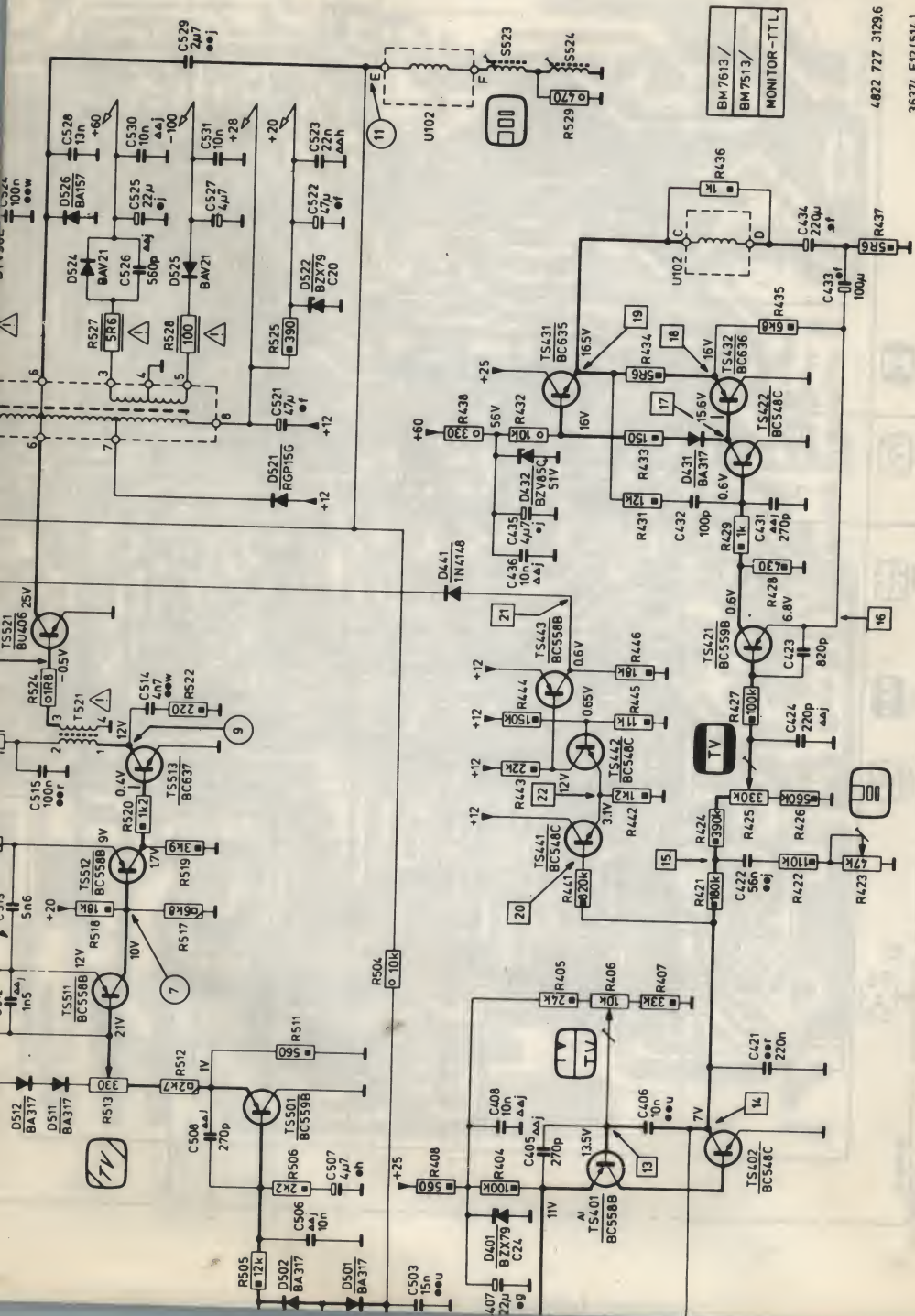
### 50. | | | | |-----|---|---| | ESC | I | n | |-----|---|---|

#### (27 108 n) Decimal (1B 6C n) Hexadecimal

This command sets the left margin in the column designated by the n parameter. Column units are calculated in terms of the current character pitch (10 cpi for Proportional character pitch). If the value of the n parameter exceeds the number of columns in a single line, designates a position beyond the right margin, or designates a position more than 5.6 inches from the left edge of the printable area, this command (3 bytes) is ignored.

When the printer receives this command, it clears its print buffer.







○ 15625Hz

\* 16V

f 25V

h 63V

i 100V

r 250V

w 600V

□ 50Hz

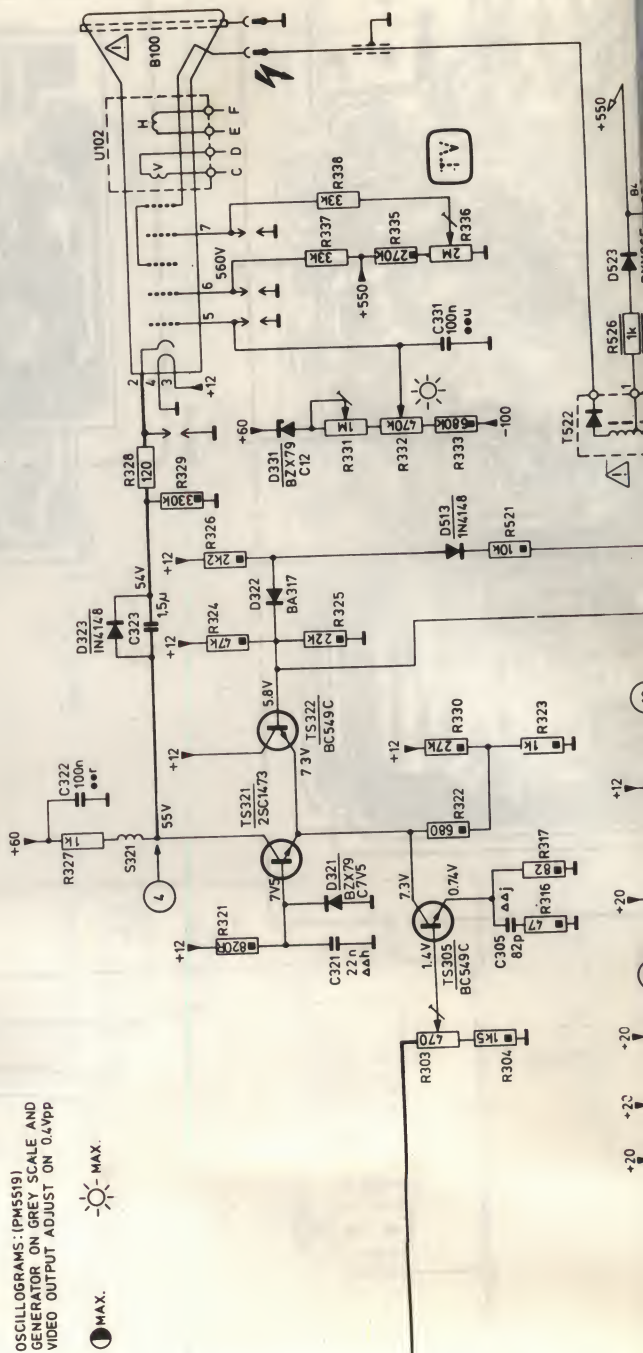
→ AC

→ DC

OSCILLOGRAMS: (PM5519)  
GENERATOR ON GREY SCALE AND  
VIDEO OUTPUT ADJUST ON 0.4Vpp



MAX.





```

10 REM LEFT MARGIN SETTINGS (ESC,1,n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"0123456789111111111122222222223333333333";CHR$(10);
50 PRINT #1,"          012345678901234567890123456789";CHR$(10);
60 REM LEFT MARGIN AT COLUMN 5
70 PRINT #1,CHR$(27);"1";CHR$(5);
80 PRINT #1,"LEFT MARGIN AT COLUMN 5";CHR$(10);
90 REM LEFT MARGIN AT COLUMN 22
100 PRINT #1,CHR$(27);"1";CHR$(22);
110 PRINT #1,"LEFT MARGIN AT COLUMN 22";CHR$(10);
120 CLOSE
130 END

```

```

0123456789111111111122222222223333333333
012345678901234567890123456789
LEFT MARGIN AT COLUMN 5
LEFT MARGIN AT COLUMN 22

```

## 51. | | | | | |-----|---|----|----| | ESC | X | n1 | n2 | |-----|---|----|----| (27 88 n1 n2) Decimal (1B 58 n1 n2) Hexadecimal

This command sets the left and right margins in the columns designated by the n1 and n2 parameters, respectively. Column units are calculated in terms of the current character pitch (10 cpi for Proportional character pitch). If  $n1 < 1$ , or  $n1 \geq n2$ , this command (4 bytes) is ignored. It is also ignored if n1 specifies a left margin position that is more than 5.6 inches from the left edge of the printable area, or if the value of the n2 parameter exceeds the number of columns in a single line.

```

10 REM SIMULTANEDOUS LEFT/RIGHT MARGIN SETTING (ESC,X,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"0123456789111111111122222222223333333333";CHR$(10);
50 PRINT #1,"          012345678901234567890123456789";CHR$(10);
60 REM LEFT AND RIGHT MARGINS
70 PRINT #1,CHR$(27);"X";CHR$(10);CHR$(14);
80 PRINT #1,"ABCDEFGH I J K L M N O P Q R S T";CHR$(10);
90 PRINT #1,CHR$(27);"X";CHR$(15);CHR$(24);
100 PRINT #1,"ABCDEFGH I J K L M N O P Q R S T";CHR$(10);
110 REM SET LEFT MARGIN BACK TO 0
120 PRINT #1,CHR$(27);"1";CHR$(0);
130 PRINT #1,"LEFT MARGIN BACK TO 0";CHR$(10);
140 CLOSE
150 END

```

```

0123456789111111111122222222223333333333
012345678901234567890123456789
ABCDE
FGHIJ
KLMNO
PQRST
    ABCDEFGHIJ
    KLMNOPQRST
LEFT MARGIN BACK TO 0

```

## Underlining

52. 

|     |   |            |
|-----|---|------------|
| ESC | - | 1 (or (1)) |
|-----|---|------------|

 (27 45 49 or 1) Decimal  
(1B 2D 31 or 01) Hexadecimal

This command designates underlining of all following character data, including spaces. However, spaces skipped due to a horizontal tab operation are not underlined, nor is graphic data.

53. 

|     |   |            |
|-----|---|------------|
| ESC | - | 0 (or (0)) |
|-----|---|------------|

 (27 45 48 or 0) Decimal  
(1B 2D 30 or 00) Hexadecimal

This command terminates underlining.

```
10 REM UNDERLINING (ESC,-,1)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"This is not underlined";CHR$(10);
50 PRINT #1,CHR$(27);"-";CHR$(1);
60 PRINT #1,"This is underlined";CHR$(10);
70 PRINT #1,CHR$(27);"-";CHR$(0);
80 PRINT #1,"This is not underlined";CHR$(10);
90 CLOSE
100 END
```

```
This is not underlined
This is underlined
This is not underlined
```

## Buffer Clear

54. 

|     |
|-----|
| CAN |
|-----|

 (24) Decimal (18) Hexadecimal

This command deletes print data that has already been input. However, control functions are still valid.

```
10 REM BUFFER CLEAR (CAN -- ASCII 24)
20 REM THIS COMMAND CLEARS ALL PRINT DATA FROM THE BUFFER
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,CHR$(27);"W";CHR$(1);
60 PRINT #1,"ABCDEFGH";
70 PRINT #1,CHR$(24);
80 REM CLEAR BUFFER
90 PRINT #1,"HIJKLMN";CHR$(10);
100 PRINT #1,CHR$(27);"W";CHR$(0);
110 CLOSE
120 END
```

H I J K L M N



## Backspace

55. **BS**

### (8) Decimal (08) Hexadecimal

This command causes the print head to move one space to the left. The next character will be overprinted.

This command is ignored when Proportional character spacing is designated.

```
10 REM BACKSPACING (BS -- ASCII 8)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM PRINT SLASHED ZEROS USING BACKSPACING
50 PRINT #1,"00000";
60 FOR I=1 TO 5
70 PRINT #1,CHR$(8);
80 NEXT I
90 PRINT #1,"/////";CHR$(10);
100 CLOSE
110 END
```

000000

## Buzzer

56. **BEL**

### (7) Decimal (07) Hexadecimal

This command causes the buzzer to sound for approximately one second.

```
10 REM BELL (BELL -- ASCII 7)
20 REM THE BELL IS ACTUALLY A BUZZER
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 FOR I=1 TO 10
60 PRINT #1,CHR$(7);
70 NEXT I
80 PRINT #1,CHR$(10);
90 CLOSE
100 END
```

## Home Positioning

57. **ESC <**

### (27 60) Decimal (1B 3C) Hexadecimal

This command causes the print head to move back to the home position (the left edge of the printable area).

```
10 REM MOVE PRINT HEAD TO HOME POSITION
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 FOR I=1 TO 5
50 PRINT #1,"PRINT - THEN HOME PRINT HEAD"
60 PRINT #1,CHR$(27);"<";
70 NEXT I
80 PRINT #1,CHR$(10);
90 CLOSE
100 END
```

PRINT - THEN HOME PRINT HEAD

## Perforation Skip

The perforation skip is the perforated area between pages of fanfold paper.

### 58. ESCNn

#### (27 78 n) Decimal (1B 4E n) Hexadecimal

This command designates perforation-skip linefeed mode, and sets a perforation skip of n lines. If the number of lines remaining on the current page is less than the value of the n parameter, the printer executes a form feed operation to move to the top of the next page.

If the value of the n parameter exceeds the number of lines on a page, this command (3 bytes) is ignored. It is also ignored if n = 0, or if n ≥ 128.

### 59. ESCO

#### (27 79) Decimal (1B 4F) Hexadecimal

This command terminates the perforation-skip linefeed mode.

```
10 REM SKIP PERFORATION
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET PAGE LENGTH TO 10 LINE
50 PRINT #1,CHR$(27);"C";CHR$(10);
60 REM PERFORM FF WHEN TWO LINES FROM BOTTOM OF PAGE
70 PRINT #1,CHR$(27);"N";CHR$(2);
80 FOR I=1 TO 30
90 PRINT #1,"LINE ";I;CHR$(10);
100 NEXT I
110 REM CANCEL SKIP PERFORATION OPTION
120 PRINT #1,CHR$(27);"O";
130 CLOSE
140 END
```

```
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
```

```
LINE 9
LINE 10
LINE 11
LINE 12
LINE 13
LINE 14
LINE 15
LINE 16
```

```
LINE 17
LINE 18
LINE 19
LINE 20
LINE 21
LINE 22
LINE 23
LINE 24
```

```
LINE 25
LINE 26
LINE 27
LINE 28
LINE 29
LINE 30
```



## Paper-out Detection

Normally, when the printer runs out of paper, the PAPER OUT lamp lights, the buzzer sounds, and the printer stops printing. It is possible to make the printer ignore its automatic paper-out detection function.

60. **ESC 8**

**(27 56) Decimal (1B 38) Hexadecimal**

This command disables the automatic paper-out detection function.

61. **ESC 9**

**(27 57) Decimal (1B 39) Hexadecimal**

This command enables the automatic paper-out detection function.

## Reset

62. **ESC @**

**(27 64) Decimal (1B 40) Hexadecimal**

This command returns the printer to its power-on state. All settings made by software commands (e.g. margins, tabs, character pitch) are canceled, all data in the print buffer is discarded, and all default settings are restored.

If EPSON, IBM or MSX mode has been set by ESC R n, this command returns the printer to PRESTEL mode.

```
10 REM PRINTER RESET (ESC,@)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET DOUBLE PRINT AND UNDERLINING
50 PRINT #1,CHR$(27);"G";CHR$(27);"~";CHR$(1);
60 PRINT #1,"THIS TEXT IS UNDERLINED AND DOUBLE PRINTED";CHR$(10);
70 REM RESET PRINTER
80 PRINT #1,CHR$(27);"@";
90 PRINT #1,"UNDERLINING AND DOUBLE STRIKE HAVE BEEN RELEASED";CHR$(10);
100 CLOSE
110 END
```

THIS TEXT IS UNDERLINED AND DOUBLE PRINTED  
UNDERLINING AND DOUBLE STRIKE HAVE BEEN RELEASED

## Printing Direction

By default, printing is bi-directional, i.e. the printer prints character data starting at the side closest to the current position of the print head. (Graphic data printing is uni-directional, i.e. it is always printed left-to-right.) Uni-directional printing is slower, but more precise.

63. **ESC U 1 (or 1))**

**(27 85 49 or 1) Decimal  
(1B 55 31 or 01) Hexadecimal**

All print data input to the printer after this command is printed uni-directionally (from left to right). This allows for more precise horizontal location of printed dots.

64. **ESC U 0 (or 00)**

**(7 85 48 or 0) Decimal**  
**(1B 55 30 or 00) Hexadecimal**

This command designates bi-directional printing of character data.

```
10 REM PRINTING DIRECTION (ESC,U,1/ESC,U,0)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM BI-DIRECTIONAL BY DEFAULT
50 PRINT #1,"<----- BI-DIRECTIONAL " ;CHR$(10);
60 PRINT #1,"----->";CHR$(10);
70 REM SELECT DIRECTIONAL PRINT
80 PRINT #1,CHR$(27);"U";CHR$(1);
90 PRINT #1,"----->";CHR$(10);
100 PRINT #1,"----->";CHR$(10);
110 REM SELECT UNI-DIRECTIONAL
120 PRINT #1,CHR$(27);"U";CHR$(0);
130 PRINT #1,"<----- DIRECTIONAL " ;CHR$(10);
140 PRINT #1,"----->";CHR$(10);
150 CLOSE
160 END
```

```
<----- BI-DIRECTIONAL
----->
----->
----->
<----- DIRECTIONAL
----->
```



## International Characters

### 65. ESC R n

### (27 82 n) Decimal (1B 52 n) Hexadecimal

**Note:** This command is valid in EPSON and PRESTEL modes. In IBM mode, this command (2 bytes) has a different syntax and function (see 66).

In EPSON mode, this command selects alternate international characters from among 11 different language fonts. The n parameter can vary from 0 to 10, and designates the font from which characters should be selected.

If n > 10, this command (3 bytes) is ignored.

| n  | Country    |
|----|------------|
| 0  | USA        |
| 1  | France     |
| 2  | Germany    |
| 3  | U.K.       |
| 4  | Denmark    |
| 5  | Sweden     |
| 6  | Italy      |
| 7  | Spain      |
| 8  | Japan      |
| 9  | Norway     |
| 10 | Denmark II |

Note that the Japan, Norway and Denmark II character sets cannot be selected via the DIP switches.

**International Characters Designated by ESC R n Command (In EPSON mode)**

| COUNTRY          |              | U.S.A. | FRANCE | GERMANY | ENGLAND | DENMARK | SWEDEN | ITALY | SPAIN | JAPAN | NORWAY | DENMARK II |
|------------------|--------------|--------|--------|---------|---------|---------|--------|-------|-------|-------|--------|------------|
| n                |              | 0      | 1      | 2       | 3       | 4       | 5      | 6     | 7     | 8     | 9      | 10         |
| C<br>O<br>D<br>E | (23) Hex     |        |        |         |         |         |        |       |       |       |        |            |
|                  | (35) Decimal | #      | #      | #       | £       | #       | #      | #     | Pt    | #     | #      | #          |
|                  | (24) H       |        |        |         |         |         | ⌘      | \$    | \$    | \$    | ⌘      | \$         |
|                  | (36) D       | \$     | \$     | \$      | \$      | \$      | ⌘      | \$    | \$    | \$    | ⌘      | \$         |
|                  | (40) H       | @      | à      | §       | @       | @       | É      | @     | @     | @     | É      | É          |
|                  | (64) D       | @      | à      | §       | @       | @       | É      | @     | @     | @     | É      | É          |
|                  | (5B) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (91) D       | [      | °      | Ä       | [       | Æ       | Ä      | °     | i     | [     | Æ      | Æ          |
|                  | (5C) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (92) D       | \      | Ç      | Ö       | \       | Ø       | Ö      | \     | N     | ¥     | Ø      | Ø          |
|                  | (5D) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (93) D       | ]      | §      | Ü       | ]       | Å       | Å      | é     | ¿     | ]     | Å      | Å          |
|                  | (5E) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (94) D       | ^      | ^      | ^       | ^       | ^       | Ü      | ^     | ^     | ^     | Ü      | Ü          |
|                  | (60) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (96) D       | `      | `      | `       | `       | `       | é      | ù     | `     | `     | é      | é          |
|                  | (7B) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (123) D      | {      | é      | ä       | {       | æ       | ä      | à     | ¨     | {     | æ      | æ          |
|                  | (7C) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (124) D      |        | ù      | ö       |         | ø       | ö      | ò     | ñ     |       | ø      | ø          |
|                  | (7D) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (125) D      | }      | è      | ü       | }       | å       | å      | è     | }     | }     | å      | å          |
|                  | (7E) H       |        |        |         |         |         |        |       |       |       |        |            |
|                  | (126) D      | -      | ¨      | ß       | -       | -       | ü      | ì     | -     | -     | ü      | ü          |

This command is independent of the International Character Set selected by DIP switches 1-3 to 1-5 in the EPSON mode.

```

10 REM INTERNATIONAL CHARACTER SETS (ESC,R,n)
20 REM THIS IS ALSO CONTROLLED BY DIP SWITCH
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,"SAMPLE USA CHARACTERS";CHR$(10);
60 PRINT #1,"# $ @ [ \ ] ^ _ { : } ~ ";CHR$(10);CHR$(10);
70 REM SELECT SAMPLE SPANISH CHARACTERS
80 PRINT #1,CHR$(27);"R";CHR$(7);
90 PRINT #1,"SAMPLE SPANISH CHARACTERS";CHR$(10);
100 PRINT #1,"# $ @ [ \ ] ^ _ { : } ~ ";CHR$(10);CHR$(10);
110 REM SELECT SAMPLE USA CHARACTERS
120 PRINT #1,CHR$(27);"R";CHR$(0);
130 PRINT #1,"SAMPLE USA CHARACTERS";CHR$(10);
140 PRINT #1,"# $ @ [ \ ] ^ _ { : } ~ ";CHR$(10);CHR$(10);
150 CLOSE
160 END

```

SAMPLE USA CHARACTERS  
# \$ @ [ \ ] ^ \_ { : } ~

SAMPLE SPANISH CHARACTERS  
R \$ @ ; Ñ ¿ ^ \_ " : } ~

SAMPLE USA CHARACTERS  
# \$ @ [ \ ] ^ \_ { : } ~

In PRESTEL mode, this command selects the codes of following countries.

n = 0 : England  
n = 1 : Sweden  
n = 2 : Italy  
n = 3 : Belgium

If n > 3 except 8, 9 and 10, 3 bytes of ESC, R, n are ignored.  
If n = 8, 9, or 10, this command has a different function (see 66).

## PRESTEL TABLE

| DEC.. | HEX. | England | Sweden | Italy | Belgium |
|-------|------|---------|--------|-------|---------|
| 35    | 23   | £       | #      | £     | é       |
| 36    | 24   | \$      | ¤      | \$    | ÿ       |
| 39    | 27   | ,       | ,      | ,     | ,       |
| 42    | 2A   | *       | *      | *     | *       |
| 44    | 2C   | ,       | ,      | ,     | ,       |
| 46    | 2E   | .       | .      | .     | .       |
| 58    | 3A   | :       | :      | :     | :       |
| 59    | 3B   | ;       | ;      | ;     | ;       |
| 63    | 3F   | ?       | ?      | ?     | ?       |
| 64    | 40   | @       | €      | €     | à       |
| 68    | 44   | D       | D      | D     | D       |
| 74    | 4A   | J       | J      | J     | J       |
| 76    | 4C   | L       | L      | L     | L       |
| 91    | 5B   | ←       | ↖      | ◦     | è       |
| 92    | 5C   | ½       | ö      | ◊     | ë       |
| 93    | 5D   | →       | å      | →     | ù       |
| 94    | 5E   | ↑       | ü      | ↑     | í       |
| 95    | 5F   | #       | —      | #     | #       |
| 96    | 60   | —       | é      | ü     | è       |
| 106   | 6A   | j       | j      | j     | j       |
| 116   | 74   | t       | t      | t     | t       |
| 123   | 75   | ¼       | ä      | ä     | ä       |
| 124   | 7C   |         | ö      | ö     | ö       |
| 125   | 7D   | ¾       | ä      | è     | ü       |
| 126   | 7E   | ÷       | ü      | í     | ◊       |



## Operation Mode Change

The power-on operation mode is determined by the settings of DIP switches 1-1 and 1-2. If the printer is in PRESTEL mode, it can be changed to MSX, EPSON or IBM mode by command.

### 66. | | | | |-----|---|---| | ESC | R | n | |-----|---|---|

#### (27 82 n) Decimal (1B 52 n) Hexadecimal

**Note:** This command is valid only in PRESTEL mode. In EPSON mode, this command (3 bytes) has a different function. In IBM mode, this command (2 bytes) has a different syntax and function (see 65. and 67.).

This command is used to change from the PRESTEL operation mode to either IBM, EPSON, or MSX mode, depending on the value of the n parameter. This value can be either 8, 9, or 10, as shown below.

| n  | Mode  |
|----|-------|
| 8  | IBM   |
| 9  | EPSON |
| 10 | MSX   |

If the value of n is less than 8 or more than 10, this command (3 bytes) is ignored.

When this command is received, the printer clears its buffer and initialises itself in the specified mode. (The initial linefeed for sensing the home position is not performed.) To return to PRESTEL mode, it is necessary to send the Reset command (ESC @ in all modes), or to turn the power off and then back on (assuming that the DIP switches are still set for PRESTEL mode).

```
10 OPEN "LPT1:" AS #1
20 WIDTH #1,255
30 PRINT #1,CHR$(188);" PRESTEL MODE ";CHR$(10)
40 PRINT #1,CHR$(27);"R";CHR$(8);
50 PRINT #1,CHR$(188);" IBM MODE ";CHR$(10)
60 PRINT #1,CHR$(27);"@";
70 PRINT #1,CHR$(188);" BACK TO PRESTEL MODE ";CHR$(10)
80 PRINT #1,CHR$(27);"R";CHR$(9)
90 PRINT #1,CHR$(188);" EPSON MODE ";CHR$(10)
100 PRINT #1,CHR$(27);"@";
110 PRINT #1,CHR$(188);" BACK TO PRESTEL MODE ";CHR$(10)
120 PRINT #1,CHR$(27);"R";CHR$(10)
130 PRINT #1,CHR$(188);" MSX MODE ";CHR$(10)
140 CLOSE
```

▣ PRESTEL MODE

▣ IBM MODE

▣ BACK TO PRESTEL MODE

◁ EPSON MODE

▣ BACK TO PRESTEL MODE

◊ MSX MODE

## Tab Initialisation

By default, horizontal tabs are set in every eighth column, and no vertical tabs are set.

### 67. ESC R

**(27 82) Decimal (1B 52) Hexadecimal**

**Note:** This command is valid only in the IBM mode. In the PRESTEL and EPSON modes, this command has a different syntax and function (see 65. and 66).

This command cancels all vertical and horizontal tab settings, and replaces them with the power-on default tab settings.

## Delete Character

### 68. DEL

**(127 or 255) Decimal (7F or FF) Hexadecimal**

This command deletes the preceding character from the print buffer. This command is ignored when Proportional character pitch is designated.

```
10 REM DELETE (DEL -- ASCII 127)
20 REM THIS DELETES THE MOST RECENT CHARACTER IN THE BUFFER
30 OPEN "LPT1:" AS #1
40 WIDTH #1,255
50 PRINT #1,"!!!!?";
60 REM DELETE THE QUESTION MARK
70 PRINT #1,CHR$(127);
80 PRINT #1,"!!!!";CHR$(10);
90 CLOSE
100 END
```

!!!!!!!

## Vertical Tab

### 69. ESC B n1 n2 ... NUL

**(27 66 n1 n2 ... 0) Decimal**

**(1B 42 n1 n2 ... 00) Hexadecimal**

This command selects vertical tab positions in channel 0. The (n1 n2 ...) parameters specify the line number of the tab; physical locations are calculated in terms of the current linefeed value. Parameters must be specified in ascending order. The NUL code terminates the command sequence. (If the value of a parameter is less than the value of the preceding parameter, the sequence is terminated, and subsequent data is interpreted as print data.) If the NUL code immediately follows the ESC B code (ESC B NUL), all vertical tabs are cleared.

The VT command is used to move to the vertical tab positions specified by this command.



70. 

|     |   |   |    |    |     |     |
|-----|---|---|----|----|-----|-----|
| ESC | b | m | n1 | n1 | ... | NUL |
|-----|---|---|----|----|-----|-----|

(27 98 m n1 n2 ... o) Decimal  
(1B 62 m n1 n2 ... 00) Hexadecimal

This command designates up to 16 tabs in one of the eight tab channels. The m parameter specifies the channel number, and its value must be less than 8. If m = 0, this command has the same function as the ESC B command described above. The n parameters are specified in the same way as in the ESC B command.

If the NUL code immediately follows the m parameter (ESC b m NUL), all vertical tabs in channel m are cleared.

This command is not valid in IBM mode.

71. 

|     |   |   |
|-----|---|---|
| ESC | / | m |
|-----|---|---|

(27 47 m) Decimal (1B 2F m) Hexadecimal

This command selects the vertical tab channel to be used. The channel is specified by the m parameter, which can have any value from 0 to 7. (If m = 0, the vertical tabs set by the ESC B command are used.) Subsequent VT commands move the print position to the vertical tabs specified in channel m by the ESC b command.

This command is not valid in IBM mode.

```

10 REM VFU SETTING/SELECTION (ESC, b, m, n1...nK, 0/ESC, /, n)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SET CHANNEL 1 TABS AT 15 AND 35
50 PRINT #1,CHR$(27);"b";CHR$(1);CHR$(15);CHR$(35);CHR$(0);
60 REM SET CHANNEL 2 TABS AT 20 AND 25
70 PRINT #1,CHR$(27);"b";CHR$(2);CHR$(20);CHR$(25);CHR$(0);
80 REM SET CHANNEL 3 TABS AT 20 AND 45
90 PRINT #1,CHR$(27);"b";CHR$(3);CHR$(20);CHR$(45);CHR$(0);
100 FOR I=1 TO 3
110 PRINT #1,"TOP OF FORM";CHR$(10);
120 PRINT #1,CHR$(27);"/";CHR$(I);
130 PRINT #1,CHR$(11);"TAB 1 FOR CHANNEL ";I
140 PRINT #1,CHR$(11);"TAB 2 FOR CHANNEL ";I
150 PRINT #1;CHR$(12);
160 NEXT I
170 DATA 1,2,3
180 CLOSE
190 END

```

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| TOP OF FORM         | TOP OF FORM         | TOP OF FORM         |
| TAB 1 FOR CHANNEL 1 |                     |                     |
|                     | TAB 1 FOR CHANNEL 2 | TAB 1 FOR CHANNEL 3 |
|                     | TAB 2 FOR CHANNEL 2 |                     |
| TAB 2 FOR CHANNEL 1 |                     |                     |
|                     |                     | TAB 2 FOR CHANNEL 3 |

## Printer Selection

72. DC3

**(19) Decimal (13) Hexadecimal**

This command puts the printer in the deselected state, in which it ignores all input data except for the DC1 code.



**73. DC1****(17) Decimal (11) Hexadecimal**

This command selects the printer, and thus terminates the DC3 command.

```

10 REM PRINTER SELECT/DESELECT (DC1/DC3)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM SELECT PRINTER IF NOT ALREADY SELECTED
50 PRINT #1,CHR$(17);
60 PRINT #1,"STANDARD PICA - 1";CHR$(10);
70 REM DESELECT THE PRINTER USING DC3
80 PRINT #1,CHR$(19);
90 PRINT #1,CHR$(27);"M";
100 PRINT #1,"ELITE PRINTING";CHR$(10);
110 REM RESELECT THE PRINTER USING DC1
120 PRINT #1,CHR$(17);
130 PRINT #1,"STANDARD PICA - 2";CHR$(10);
140 CLOSE
150 END

```

```

STANDARD PICA - 1
STANDARD PICA - 2

```

**Download Characters (User-defined characters)**

In EPSON and PRESTEL modes, it is possible to define and download special user-defined characters for the printer, provided that DIP switch 1-8 is set to ON. (The factory setting is OFF.)

A maximum of 128 download characters can be defined and stored in the RAM area. The contents of this area are lost when the power is turned off.

To use the download characters, switch from the default character set in the ROM to the download character set in the RAM by inputting the ESC % (1) (0) command. These characters are printed in Draft mode.

Note that when download character mode is selected, the communication buffer is reduced from 2.3K bytes to 0.7K bytes.

None of the following four commands are valid in IBM mode.

**74. ESC % (0) (0)****(27 37 0 0) Decimal (1B 25 00 00) Hexadecimal**

This command selects the normal character set stored in the ROM. This character set cannot be modified. It is selected by default.

This command is not valid in IBM mode.

**75. ESC % (1) (0)****(27 37 1 0) Decimal (1B 25 01 00) Hexadecimal**

This command selects the download character set stored in the RAM.

At power-on time, no characters are written in this area. The ESC & command is used to write download characters into the RAM area.

This command is not valid in IBM mode.

76. 

|     |   |     |     |     |
|-----|---|-----|-----|-----|
| ESC | : | (0) | (0) | (0) |
|-----|---|-----|-----|-----|

(27 58 0 0 0) Decimal  
(1B 3A 00 00 00) Hexadecimal

This command copies the characters from the ROM character set into the download character set stored in the RAM. Specific characters can then be modified, while leaving the remaining characters unchanged, so that a complete character set will be available.

This command is not valid in IBM mode.

77. 

|     |   |     |   |   |   |    |    |     |     |
|-----|---|-----|---|---|---|----|----|-----|-----|
| ESC | & | (0) | n | m | a | c0 | c1 | ... | c10 |
|-----|---|-----|---|---|---|----|----|-----|-----|

(27 38 0 n m a c0 c1 ... c10) Decimal  
(1B 26 00 n m a c0 c1 ... c10) Hexadecimal

## Hexadecimal

This command defines download characters. These characters are assigned codes in the range from (0) decimal through (127) decimal.

The n parameter designates the code of the first character downloaded by this command, and the m parameter designates the code of the last downloaded character. the value of m must be greater than or equal to that of n; if n = m, only one character is to be downloaded. The a parameter provides information concerning descenders (e.g. the lower part of the "g" character) and proportions of download characters.

The following groups of 11 bytes each define the actual dot pattern of a download character. There should be a total of (n - m + 1) such groups, each consisting of 11 bytes.

This command is not valid in IBM mode.

**Note:** Since international characters are assigned to codes (0) to (31) and (127) decimal, as shown in the following table, international characters will be replaced by any user- defined characters downloaded with these codes.



## International character code assignment

| L H | 0  | 1  | 7   |
|-----|----|----|-----|
| 0   | à  | §  |     |
|     | 0  | 16 | 112 |
| 1   | è  | ß  |     |
|     | 1  | 17 | 113 |
| 2   | ù  | Æ  |     |
|     | 2  | 18 | 114 |
| 3   | ò  | æ  |     |
|     | 3  | 19 | 115 |
| 4   | ì  | Ø  |     |
|     | 4  | 20 | 116 |
| 5   | °  | ø  |     |
|     | 5  | 21 | 117 |
| 6   | £  | "  |     |
|     | 6  | 22 | 118 |
| 7   | ı  | Ä  |     |
|     | 7  | 23 | 119 |
| 8   | ı  | Ö  |     |
|     | 8  | 24 | 120 |
| 9   | Ñ  | Ü  |     |
|     | 9  | 25 | 121 |
| A   | ñ  | ä  |     |
|     | 10 | 26 | 122 |
| B   | ☒  | ö  |     |
|     | 11 | 27 | 123 |
| C   | Pt | ü  |     |
|     | 12 | 28 | 124 |
| D   | Å  | É  |     |
|     | 13 | 29 | 125 |
| E   | å  | é  |     |
|     | 14 | 30 | 126 |
| F   | ç  | ¥  | Ø   |
|     | 15 | 31 | 127 |

**Example:** When U.K. is selected and a download character is assigned code (6) decimal, the input of code (35) to the printer will cause it to print the download character rather than "£".

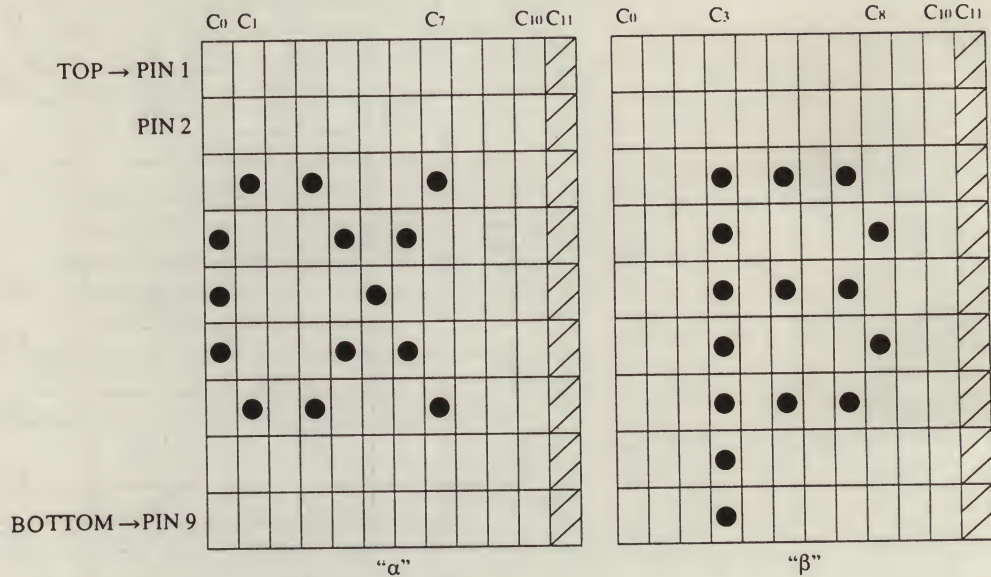
Refer to the international character table included with the explanation of the ESC R n command. (See 65. above.)

Example of defining characters "α" and "β" for codes (65) decimal and (66) decimal, respectively.

- 1) At power-on, the printer automatically selects the ROM character set, regardless of the setting of DIP switch 1-8. Therefore, it is necessary to input the ESC % (1) (0) command before downloading characters.

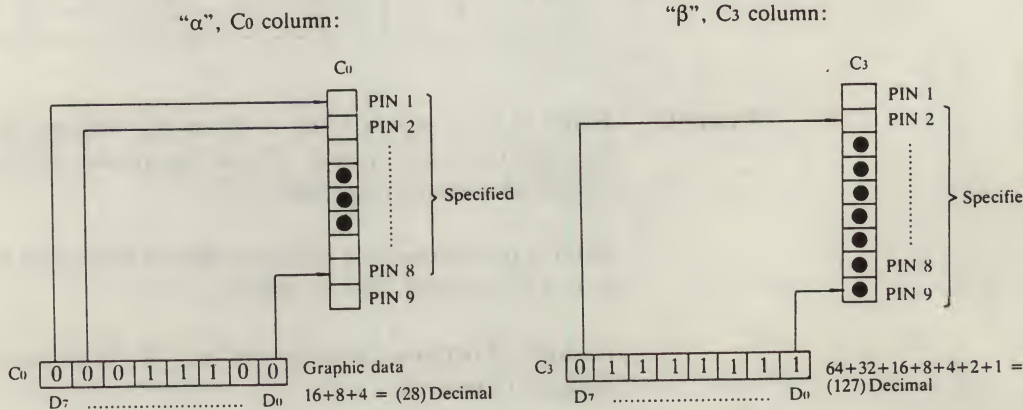
2) Since no download characters are defined at power-on time, all characters in the RAM character set are blank spaces. To avoid having to define all characters, it is a good idea to use the ESC : (0) (0) (0) command to copy the ROM characters into the RAM character set. Individual characters can then be downloaded as needed, using the ESC & command.

3) The following charts show the dot patterns of the characters to be downloaded



**Note:** Horizontally adjacent dots are not printed.

4) The relationship between PIN 1 to PIN 9 and graphic data is as follows.



When bit 7 of parameter a is 1, PIN 1 to PIN 8 are specified.

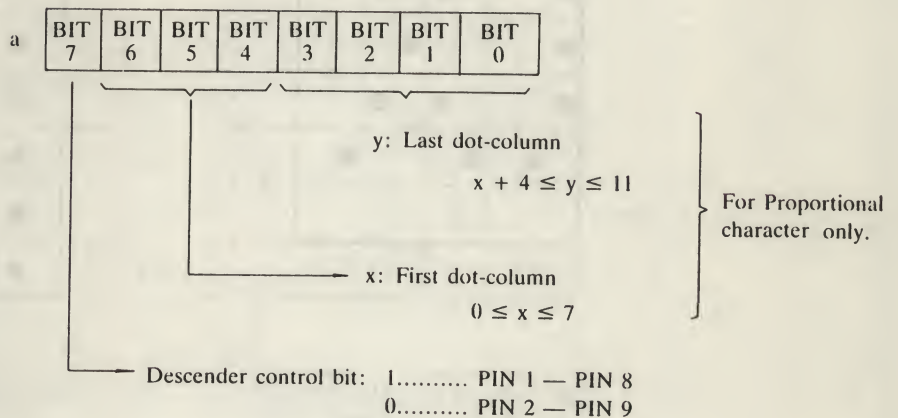
When bit 7 of parameter a is 0, PIN 2 to PIN 9 are specified



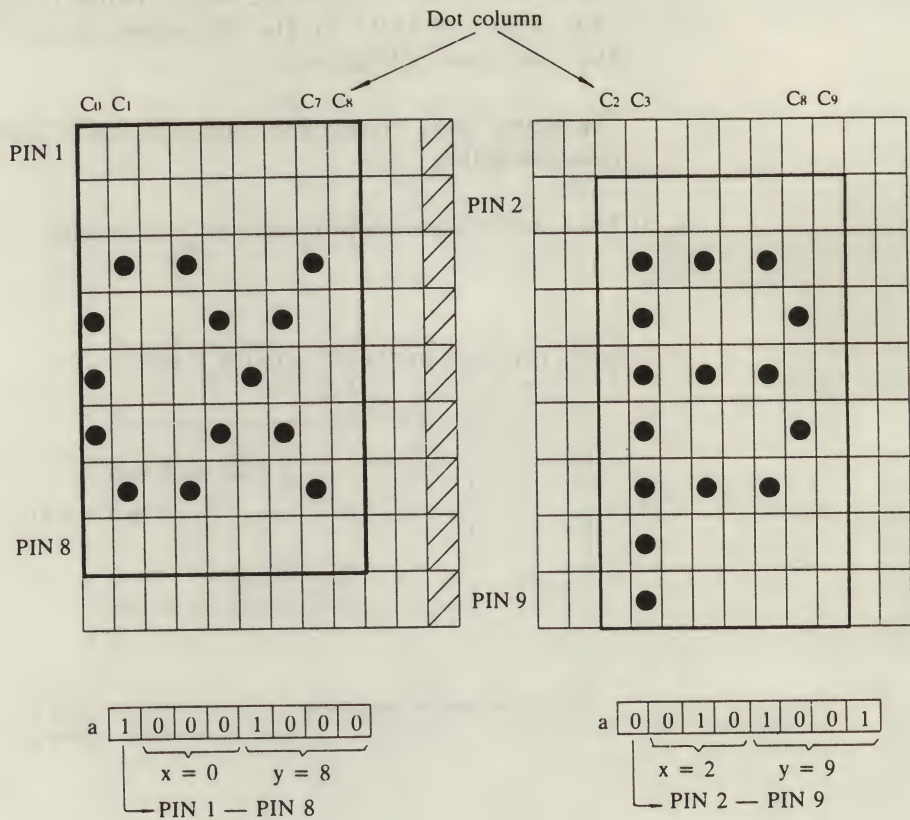
The decimal codes to specify the pattern for the "α" character are thus (28 34 0 34 20 8 20 34 0 0 0). The 12th column of every character is always blank, and need not be defined.

The decimal codes to specify the pattern for the "β" character are (0 0 0 127 0 84 0 84 40 0 0).

5) The a (attribute) parameter is explained here in detail.



**Example:**



With the above character compositions, “ $\alpha$ ” for code (65)Decimal and “ $\beta$ ” for code (66)Decimal can be defined as follows.

|              |                         |                      |
|--------------|-------------------------|----------------------|
| “ $\alpha$ ” | ESC, &, 00, n, m        | 27, 38, 0, 65, 66    |
|              | a                       | 136,                 |
| “ $\beta$ ”  | C0, C1, C2, C3, C4, C5, | 28, 34, 0, 34, 20, 8 |
|              | C6, C7, C8, C9, C10,    | 20, 34, 0, 0, 0      |
|              | a                       | 41,                  |
|              | C0, C1, C2, C3, C4, C5, | 0, 0, 0, 127, 0, 84  |
|              | C6, C7, C8, C9, C10,    | 0, 84, 40, 0, 0      |



## 6) Programme example

```
10 REM DOWNLOAD CHARACTER
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 REM DIP SWITCH 1-6 ON
50 REM SETS PROPORTIONAL
60 PRINT #1,CHR$(27);"p1";
70 PRINT #1,CHR$(27);"&";CHR$(0);
80 PRINT #1,CHR$(65);CHR$(65);
90 PRINT #1,CHR$(136);
100 PRINT #1,CHR$(28);CHR$(34);CHR$(0);CHR$(34);
110 PRINT #1,CHR$(20);CHR$(8);CHR$(20);CHR$(34);
120 PRINT #1,CHR$(0);CHR$(0);CHR$(0);
130 PRINT #1,CHR$(27);"%";CHR$(1);CHR$(0);
140 REM SELECTS THE DOWNLOAD CHARACTER
150 FOR I=1 TO 20
160 PRINT #1,;CHR$(65);
170 NEXT I
180 PRINT #1,CHR$(10);
190 REM CLEARS PROPORTIONAL
200 PRINT #1,CHR$(27);"p0";
210 FOR I=1 TO 20
220 PRINT #1,;CHR$(65);
230 NEXT I
240 PRINT #1,CHR$(10);
250 PRINT #1,CHR$(27);"%";CHR$(0);CHR$(0);
260 REM SELECTS THE ROM CHARACTER
270 FOR I=1 TO 20
280 PRINT #1,;CHR$(65);
290 NEXT I
300 PRINT #1,CHR$(10);
310 CLOSE
320 END
```

```
xxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxx
AAAAAAAAAAAAAAAAAAAAAA
```

## Input Data Control

These commands affect the way in which the printer interprets all incoming data bytes.

### 78. ESC =

#### (27 61) Decimal (1B 3D) Hexadecimal

This command causes the printer to set the eighth bit (MSB) of each incoming byte to 0. This is because some computers always set this bit to 1. After this command is input, no data bytes are interpreted as being greater than 127.

This command is not valid in IBM mode.

```
10 REM MSB SET TO 0 (ESC,=)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);"=";
50 FOR I=32 TO 80
60 PRINT #1,CHR$(I);
70 NEXT I
80 PRINT #1,CHR$(10);
90 FOR I=160 TO 208
100 PRINT #1,CHR$(I);
110 NEXT I
120 PRINT #1,CHR$(10);
130 CLOSE
140 END
```

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
```

### 79. ESC >

#### (27 62) Decimal (1B 3E) Hexadecimal

This command causes the printer to set the eighth (MSB) bit of each incoming byte to 1. In most cases, this causes text to be printed in italics. After this command is input, no data bytes are interpreted as being less than 128.

This command is not valid in IBM mode.

```
10 REM MSB SET TO 1 (ESC,>)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);">";
50 FOR I=32 TO 80
60 PRINT #1,CHR$(I);
70 NEXT I
80 PRINT #1,CHR$(10);
90 FOR I=160 TO 208
100 PRINT #1,CHR$(I);
110 NEXT I
120 PRINT #1,CHR$(10);
130 CLOSE
140 END
```

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
```



80. **ESC #****(27 35) Decimal (1B 23) Hexadecimal**

This command terminates the eighth-bit control mode set by the ESC = or ESC > commands. This restores the power-on data control state.

This command is not valid in IBM mode.

```
10 REM MSB UNDER SOFTWARE CONTROL (ESC, #)
20 OPEN "LPT1:" AS #1
30 WIDTH #1, 255
40 PRINT #1, CHR$(27); "#";
50 FOR I=32 TO 80
60 PRINT #1, CHR$(I);
70 NEXT I
80 PRINT #1, CHR$(10);
90 FOR I=160 TO 208
100 PRINT #1, CHR$(I);
110 NEXT I
120 PRINT #1, CHR$(10);
130 CLOSE
140 END
```

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
```

## Print Code Area Designation

81. **ESC 6****(27 54) Decimal (1B 36) Hexadecimal**

In EPSON mode, this command causes the printer to print italic characters for decimal codes (128) to (159), and (255). The characters correspond to codes as shown in the table below. Some of these codes are normally assigned to control functions, as shown in the EPSON character set table in Appendix C.

In IBM mode, this command selects IBM character set 2.

In PRESTEL mode, this command (2 bytes) is ignored.

| Upper<br>Lower | 8   | 9   | F   |
|----------------|-----|-----|-----|
| 0              | à   | §   |     |
|                | 128 | 144 | 240 |
| 1              | è   | ß   |     |
|                | 129 | 145 | 241 |
| 2              | ù   | Æ   |     |
|                | 130 | 146 | 242 |
| 3              | ò   | æ   |     |
|                | 131 | 147 | 243 |
| 4              | ì   | Ø   |     |
|                | 132 | 148 | 244 |
| 5              | °   | ø   |     |
|                | 133 | 149 | 245 |
| 6              | £   |     |     |
|                | 134 | 150 | 246 |
| 7              | ï   | Ä   |     |
|                | 135 | 151 | 247 |
| 8              | ı   | Ö   |     |
|                | 136 | 152 | 248 |
| 9              | Ñ   | Ü   |     |
|                | 137 | 153 | 249 |
| A              | ñ   | ä   |     |
|                | 138 | 154 | 250 |
| B              | Ö   | ö   |     |
|                | 139 | 155 | 251 |
| C              | Pt  | ü   |     |
|                | 140 | 156 | 252 |
| D              | Å   | É   |     |
|                | 141 | 157 | 253 |
| E              | å   | é   |     |
|                | 142 | 158 | 254 |
| F              | Ç   | ¥   | Ø   |
|                | 143 | 159 | 255 |

```

10 REM ITALIC INTERNATIONAL CHARACTERS
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"ITALIC INTERNATIONAL CHARACTERS";CHR$(10);
50 PRINT #1,CHR$(27);"6";
60 FOR I=128 TO 159
70 PRINT #1,CHR$(I);
80 NEXT I
90 FOR I=240 TO 255
100 PRINT #1,CHR$(I);
110 NEXT I
120 PRINT #1,CHR$(10);
130 CLOSE
140 END

```

ITALIC INTERNATIONAL CHARACTERS

àèùòì°£;ıÑññRÅÇßÆØ"XÜÜÄÜÉÉ¥pqrstuvwxyz{;}~0



**82. ESC 7****(27 55) Decimal (1B 37) Hexadecimal**

In EPSON mode, this command terminates the function of the ESC 6 command. Decimal codes (128) to (159) and (255) thereafter function as control codes.

In IBM mode, this command selects IBM character set 1.

In PRESTEL mode, this command (2 bytes) is ignored.

**83. ESC I 1 (or (1))****(27 73 49 or 1) Decimal  
(1B 49 31 or 01) Hexadecimal**

This command designates print characters in the range from (0) to (31) decimal, and (128) to (159) decimal. Some of these codes, however, continue to function as control codes. (Refer to the chart on the next page.) The character codes designated in the range from (128) to (159) are printed in italics.

This first two bytes of this command are ignored in PRESTEL mode.

```
10 REM PRINTING OF UNDEFINED CODE
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,CHR$(27);" I";CHR$(1);
50 FOR I=0 TO 6
60 PRINT #1,CHR$(I);
70 NEXT I
80 FOR I=16 TO 17
90 PRINT #1,CHR$(I);
100 NEXT I
110 FOR I=21 TO 23
120 PRINT #1,CHR$(I);
130 NEXT I
140 FOR I=28 TO 31
150 PRINT #1,CHR$(I);
160 NEXT I
170 PRINT #1,CHR$(10);
180 PRINT #1,CHR$(27);" I";CHR$(0);
190 CLOSE
200 END
```

æøùì°£\$ßø"XUE\$Y

**84. ESC I 0 (or (0))****(27 73 48 or 0) Decimal  
(1B 49 30 or 00) Hexadecimal**

This command terminates the function of the ESC I 1 command. Decimal codes from (0) to (31) and (128) to (159) are restored to their normal functions.

This first two bytes of this command are ignored in PRESTEL mode.

## Immediate Printing Mode

Normally, the printer prints a string of data only when it receives carriage return, linefeed, form feed, or vertical tab command. the printer can, however, print each character or partial line as it is received.

85. 

|     |   |            |
|-----|---|------------|
| ESC | i | 1 (or (1)) |
|-----|---|------------|

 (27 105 49 or 1) Decimal  
(1B 69 31 or 01) Hexadecimal

This command designates the immediate print mode. In this mode, the printer prints received character data immediately if no further data is received within 0.2 seconds.

86. 

|     |   |            |
|-----|---|------------|
| ESC | i | 0 (or (0)) |
|-----|---|------------|

 (27 105 48 or 0) Decimal  
(1B 69 30 or 00) Hexadecimal

This command terminates the immediate print mode.

## CSF Control

These commands are useful only when the optional Cut Sheet Feeder (CSF) is installed.

87. 

|     |    |   |
|-----|----|---|
| ESC | EM | 4 |
|-----|----|---|

 (27 25 52) Decimal (1B 19 34) Hexadecimal

This command designates the CSF mode. The printer must receive this command before the CSF can be used.

This command is valid only if DIP switch 2-1 is set to ON.

88. 

|     |    |   |
|-----|----|---|
| ESC | EM | 0 |
|-----|----|---|

 (27 25 48) Decimal (1B 19 30) Hexadecimal

This command terminates the CSF mode.

89. 

|     |    |   |
|-----|----|---|
| ESC | EM | R |
|-----|----|---|

 (27 25 82) Decimal (1B 19 52) Hexadecimal

This command causes the printer to eject a cut sheet. This command is valid only in CSF mode.

## CR Code Control

These commands can be used to control the way in which the printer responds to the CR command. They are not valid in the EPSON and PRESTEL modes.

90. 

|     |   |            |
|-----|---|------------|
| ESC | 5 | 1 (or (1)) |
|-----|---|------------|

 (27 53 49 or 1) Decimal  
(1B 35 31 or 01) Hexadecimal

This command causes the printer to execute a linefeed with each carriage return (CR command), regardless of the level of the AUTOFEED signal or the setting of DIP switch 1-7.

This command is valid only in IBM mode.



91. **ESC 5 0 (or 00)** (27 53 48 or 0) Decimal  
(1B 35 30 or 00) Hexadecimal

This command inhibits the printer from performing a linefeed when it receives a CR code, regardless of the level of the AUTOFEED signal or the setting of DIP switch 1-7.

This command is valid only in IBM mode.

**Print Position Control**

It is possible to move the print head directly to a desired position within a line, or to change the amount by which the print head moves when it prints a character.

92. **ESC SP n** (27 32 n) Decimal (1B 20 n) Hexadecimal

This command causes the printer to insert blank dot columns between characters. The number of dot columns is specified by the n parameter, the value of which must be in the range from 0 to 127. The width of one dot column depends on the current character pitch, as shown below.

| Print Mode |                        | Dot pitch |
|------------|------------------------|-----------|
| Draft      | Pica 10 cpi            | n/120"    |
|            | Elite 12 cpi           | n/144"    |
|            | Condensed 17 cpi       | n/240"    |
|            | Condensed Elite 20 cpi | n/240"    |
| LQ         | Pica 10 cpi            | n/240"    |
|            | Elite 12 cpi           | n/288"    |

```

10 REM PRINT POSITION CONTROL
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"ABCDE";
50 PRINT #1,CHR$(27);CHR$(32);CHR$(120);
60 PRINT #1,"FGHI";
70 PRINT #1,CHR$(27);CHR$(32);CHR$(0);
80 PRINT #1,"JKLMN";CHR$(10);
90 REM CONDENSED CHARACTER DESIGNATION
100 PRINT #1,CHR$(15);
110 PRINT #1,"ABCDE";
120 PRINT #1,CHR$(27);CHR$(32);CHR$(120);
130 PRINT #1,"FGHI";
140 PRINT #1,CHR$(27);CHR$(32);CHR$(0);
150 PRINT #1,"JKLMN";CHR$(10);
160 PRINT #1,CHR$(18);"CLEAR CONDENSED
170 CLOSE
180 END

```

ABCDEF                      G                      H                      I                      JKLMN  
 ABCDEF                      6                      H                      I                      JKLMN

93. **ESC \$ n1 n2** (27 36 n1 n2) Decimal (1B 24 n1 n2) Hexadecimal

This command moves the print head to the absolute position specified by the n1 and n2 parameters. The absolute position is calculated as  $(n1 + (n2 \times 256)) \times 1/60$  inch from the left edge of the printable area.

This command (4 bytes) is ignored if the specified position is beyond the right margin.

```
10 REM MOVE PRINT HEAD TO ABSOLUTE DOT POSITION (ESC,$,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"MOVE";
50 PRINT #1,CHR$(27);"$";CHR$(60);CHR$(0);
60 PRINT #1,"TO ONE INCH FROM LEFT COLUMN";CHR$(10);
70 PRINT #1,CHR$(15);
80 PRINT #1,"MOVE";
90 PRINT #1,CHR$(27);"$";CHR$(60);CHR$(0);
100 PRINT #1,"TO ONE INCH FROM LEFT COLUMN AGAIN";CHR$(10);
110 PRINT #1,CHR$(18);
120 CLOSE
130 END
```

|      |                                    |
|------|------------------------------------|
| MOVE | TO ONE INCH FROM LEFT COLUMN       |
| MOVE | TO ONE INCH FROM LEFT COLUMN AGAIN |

#### 94. | | | | | |-----|---|----|----| | ESC | \ | n1 | n2 | |-----|---|----|----| (27 92 n1 n2) Decimal (1B 5C n1 n2) Hexadecimal

This command moves the print head relative to its current position. The number of dots by which to move the print head is specified by the n1 and n2 parameters, and is equal to  $n1 + (n2 \times 256)$ . The width of one column depends on the current character pitch, in the same way as for the ESC SP n command. (Refer to 92.)

The print head moves to the left or right depending on the values specified for n1 and n2. (If  $n2 \geq 128$ , movement will be to the left.) The number of columns specified follows the normal rules for 16-bit negative (2-byte) integer constants.

```
10 REM MOVE PRINT HEAD TO RELATIVE DOT POSITION(ESC,\,n1,n2)
20 OPEN "LPT1:" AS #1
30 WIDTH #1,255
40 PRINT #1,"MOVE";
50 PRINT #1,CHR$(27);"\";CHR$(20);CHR$(0);
60 PRINT #1,"20 DOT POSITIONS TO THE RIGHT";CHR$(10);
70 PRINT #1,CHR$(15);
80 PRINT #1,"MOVE";
90 PRINT #1,CHR$(27);"\";CHR$(20);CHR$(0);
100 PRINT #1,"20 DOT POSITIONS TO THE RIGHT AGAIN";CHR$(10);
110 PRINT #1,CHR$(18);
120 CLOSE
130 END
```

|                                          |
|------------------------------------------|
| MOVE 20 DOT POSITIONS TO THE RIGHT       |
| MOVE 20 DOT POSITIONS TO THE RIGHT AGAIN |



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# USING A CUT SHEET FEEDER

Follow the procedure described in the CSF owner's manual when using the CSF for the first time.

## CSF Mode Setting

To use the CSF in MSX mode, no special actions are necessary.

To use the CSF in any of the other modes, it is necessary to place the printer in the CSF mode in either of the following ways.

1. Set DIP switch 2-1 to ON before turning on the printer.
2. Send the ESC EM 4 command. (Refer to page 118.)

| Function                     | Symbol                        | Hex code      | Decimal code  |
|------------------------------|-------------------------------|---------------|---------------|
| CSF mode designation         | <b>ESC</b> <b>EM</b> <b>4</b> | (1B, 19, 34)H | (27, 25, 52)D |
| CSF mode termination         | <b>ESC</b> <b>EM</b> <b>0</b> | (1B, 19, 30)H | (27, 25, 48)D |
| Paper ejection (In CSF mode) | <b>ESC</b> <b>EM</b> <b>R</b> | (1B, 19, 52)H | (27, 25, 82)D |

Note that software commands supersede the DIP switch setting.

## Features that Change in the CSF Mode

### 1. LF and VT codes

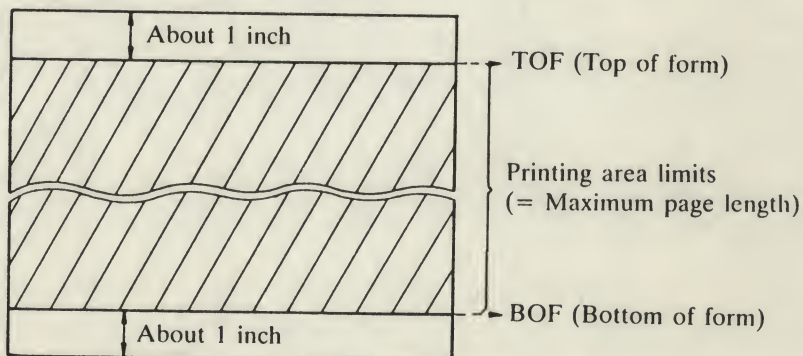
When a linefeed or vertical tab moves the print position beyond the end of the current page, the cut sheet is ejected and a new sheet is fed into the printer.

### 2. FF code

The cut sheet is ejected and a new sheet is fed into the printer.

### 3. Specifying the page length

If the specified page length exceeds the length of the cut sheet loaded from the CSF, the bottom of the printable area (bottom of form: BOF) automatically becomes the end of the page. The printable area on a cut sheet is as shown in the illustration below.



Note that the top and bottom one inch of cut sheets cannot be printed upon due to mechanical restrictions.

#### **4. Paper-out detection**

If the printer is in CSF mode at power-on time, it enters the ON-LINE state even if there is no paper inserted. When the printer receives a print command, it loads a sheet from the CSF and starts printing. If there was already a sheet in the printer at power-on, that sheet is ejected, and another sheet loaded, before printing starts.

The paper-out detection function is disabled in CSF mode.

#### **5. Reverse linefeeds**

Reverse linefeeds are ignored in CSF mode.

### **CSF Error Conditions**

1. If a sheet loaded from the CSF is more than 22 inches in length, the printer enters the CSF error state.

2. If the printer performs linefeeds for 22 inches from the TOF without a new cut sheet being loaded, it enters the CSF error state.

In the CSF error state, the buzzer sounds, the PAPER OUT lamp blinks on and off at one-second intervals, and the ON-LINE lamp goes out.

### **Clearing Errors**

To clear CSF errors, press the ON-LINE or FORM FEED switch. If the ON-LINE switch is pressed, the printer ejects the current sheet, loads a new one, and returns to the ON-LINE state. If the FORM FEED switch is pressed, the current sheet is ejected and a new one is loaded, but the printer remains OFF-LINE. It is necessary to press the ON-LINE switch to return the printer to the ON-LINE state.

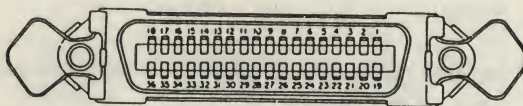


## APPENDIX A PAPER SPECIFICATIONS

|                  |                                                              |
|------------------|--------------------------------------------------------------|
| Paper width      | Minimum: 4 inches<br>Maximum: 10 inches                      |
| Paper weight     | 50 - 80 g/m <sup>2</sup>                                     |
| Number of copies | Maximum original plus two copies (combined thickness 0.2 mm) |

## APPENDIX B PARALLEL INTERFACE

### 1. Input connector



Signal Diagram

| PIN | SIGNAL      | IN/OUT | PIN | SIGNAL  | IN/OUT |
|-----|-------------|--------|-----|---------|--------|
| 1   | STROBE      | IN     | 19  | GND     |        |
| 2   | DATA 1      | IN     | 20  | GND     |        |
| 3   | DATA 2      | IN     | 21  | GND     |        |
| 4   | DATA 3      | IN     | 22  | GND     |        |
| 5   | DATA 4      | IN     | 23  | GND     |        |
| 6   | DATA 5      | IN     | 24  | GND     |        |
| 7   | DATA 6      | IN     | 25  | GND     |        |
| 8   | DATA 7      | IN     | 26  | GND     |        |
| 9   | DATA 8      | IN     | 27  | GND     |        |
| 10  | ACK         | OUT    | 28  | GND     |        |
| 11  | BUSY        | OUT    | 29  | GND     |        |
| 12  | P. EMP      | OUT    | 30  | GND     |        |
| 13  | HIGH        |        | 31  | INITIAL | IN     |
| 14  | AUTO FEED   | IN     | 32  | ERROR   | OUT    |
| 15  | NC          |        | 33  | GND     |        |
| 16  | GND         |        | 34  | NC      |        |
| 17  | CHASSIS GND |        | 35  | HIGH    |        |
| 18  | NC          |        | 36  | NC      |        |

**Note 1:** High is connected through a 2.2 kΩ pull-resistor to +5V.

**Note 2:** NC stands for lines Not Connected.

**Note 3:** The AUTO FEED signal (pin 14) is ignored in MSX mode.

## 2. Signal Explanations

### (a) Signals input to the printer

**DATA 1 — DATA 8** 8-bit data signal; "1" is HIGH. DATA 1 is the MSB of each byte, and DATA 8 the LSB.

**STROBE** Strobe signal used to read eight bits of data. Data is input when this signal is LOW.

**INITIAL** Initialises the printer. This signal is normally HIGH; when this signal goes LOW and then HIGH again, the printer is initialised.

**AUTOFEED** In IBM, EPSON, and PRESTEL modes, if DIP switch 1-7 is set to OFF (factory setting), a linefeed is appended to each carriage return when this signal (normally HIGH) goes to LOW. If DIP switch 1-7 is set to ON, a linefeed is always performed after a carriage return.

In IBM mode only, the ESC 5 n command can override this signal to control linefeed execution.

In MSX mode, this signal is ignored.

### (b) Signals output from the printer

**BUSY** This signal informs the host computer that the printer is in the BUSY state. When this signal is set to HIGH, the printer cannot receive data. This signal goes to HIGH in the following cases.

- While performing initialisation operations.
- While the printer is inputting data via the STROBE signal.
- While performing the self-test.
- When the printer is off-line (the ON-LINE lamp is not lit). The printer goes off-line when it runs out of paper, when an error is detected, or when the ON-LINE switch is pressed. In the former two cases, the PAPER-OUT lamp blinks.
- While the character pitch is being set via the front-panel switches.

**ACK** When the BUSY state has been entered due to an initialisation, data input, or self-test, this signal is output synchronised with the falling edge of the BUSY signal.

**P. EMP** This signal goes to HIGH when the printer detects that it is out of paper.



## ERROR

This signal is set to LOW to indicate that a printer is in an error state. The following conditions will cause this signal to be set to LOW.

- An internal RAM error is detected during initialisation.
- The home position cannot be detected.
- The printer runs out of paper.
- The printer is off-line.

If the error is an internal ROM or home position error, turn the power off and then on again (or input the INITIAL signal) to clear the error. Paper-out errors are automatically cleared when paper is inserted.

# APPENDIX C CHARACTER SET TABLE

## MSX CHARACTER SET (IN MSX MODE)

| DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC  | HEX  | CHAR |
|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|------|------|------|
| 32  | 20  | !    | 128 | 80  | Ç    | 160 | A0  | À    | 192 | C0  | ┐    | 224 | E0  | α    | 1,64 | 1,40 |      |
| 33  | 21  | "    | 129 | 81  | ü    | 161 | A1  | Á    | 193 | C1  | └    | 225 | E1  | β    | 1,65 | 1,41 |      |
| 34  | 22  | #    | 130 | 82  | é    | 162 | A2  | Â    | 194 | C2  | ─    | 226 | E2  | Γ    | 1,66 | 1,42 |      |
| 35  | 23  | \$   | 131 | 83  | à    | 163 | A3  | Ã    | 195 | C3  | ▬    | 227 | E3  | π    | 1,67 | 1,43 |      |
| 36  | 24  | %    | 132 | 84  | á    | 164 | A4  | Ä    | 196 | C4  | ▬    | 228 | E4  | Σ    | 1,68 | 1,44 |      |
| 37  | 25  | &    | 133 | 85  | ä    | 165 | A5  | Å    | 197 | C5  | ▬    | 229 | E5  | σ    | 1,69 | 1,45 |      |
| 38  | 26  | '    | 134 | 86  | å    | 166 | A6  | Æ    | 198 | C6  | ▬    | 230 | E6  | μ    | 1,70 | 1,46 |      |
| 39  | 27  | ,    | 135 | 87  | ç    | 167 | A7  | Ç    | 199 | C7  | ▬    | 231 | E7  | τ    | 1,71 | 1,47 |      |
| 40  | 28  | (    | 136 | 88  | ê    | 168 | A8  | È    | 200 | C8  | ▬    | 232 | E8  | ϑ    | 1,72 | 1,48 |      |
| 41  | 29  | )    | 137 | 89  | ë    | 169 | A9  | É    | 201 | C9  | ▬    | 233 | E9  | θ    | 1,73 | 1,49 |      |
| 42  | 2A  | *    | 138 | 8A  | è    | 170 | AA  | Ê    | 202 | CA  | ▬    | 234 | EA  | Ω    | 1,74 | 1,4A |      |
| 43  | 2B  | +    | 139 | 8B  | í    | 171 | AB  | Ë    | 203 | CB  | ▬    | 235 | EB  | δ    | 1,75 | 1,4B |      |
| 44  | 2C  | -    | 140 | 8C  | î    | 172 | AC  | Ì    | 204 | CC  | ▬    | 236 | EC  | ϕ    | 1,76 | 1,4C |      |
| 45  | 2D  | .    | 141 | 8D  | ï    | 173 | AD  | Í    | 205 | CD  | ▬    | 237 | ED  | Ø    | 1,77 | 1,4D |      |
| 46  | 2E  | /    | 142 | 8E  | ä    | 174 | AE  | Î    | 206 | CE  | ▬    | 238 | EE  | ∈    | 1,78 | 1,4E |      |
| 47  | 2F  | 0    | 143 | 8F  | ä    | 175 | AF  | Ï    | 207 | CF  | ▬    | 239 | EF  | ≡    | 1,79 | 1,4F |      |
| 48  | 30  | 1    | 144 | 90  | æ    | 176 | B0  | Æ    | 208 | D0  | ▬    | 240 | F0  | ±    | 1,80 | 1,50 |      |
| 49  | 31  | 2    | 145 | 91  | æ    | 177 | B1  | Å    | 209 | D1  | ▬    | 241 | F1  | ≡    | 1,81 | 1,51 |      |
| 50  | 32  | 3    | 146 | 92  | æ    | 178 | B2  | Ä    | 210 | D2  | ▬    | 242 | F2  | ≡    | 1,82 | 1,52 |      |
| 51  | 33  | 4    | 147 | 93  | ä    | 179 | B3  | Å    | 211 | D3  | ▬    | 243 | F3  | ≡    | 1,83 | 1,53 |      |
| 52  | 34  | 5    | 148 | 94  | ä    | 180 | B4  | Ö    | 212 | D4  | ▬    | 244 | F4  | ≡    | 1,84 | 1,54 |      |
| 53  | 35  | 6    | 149 | 95  | ä    | 181 | B5  | Ö    | 213 | D5  | ▬    | 245 | F5  | ≡    | 1,85 | 1,55 |      |
| 54  | 36  | 7    | 150 | 96  | ü    | 182 | B6  | Ü    | 214 | D6  | ▬    | 246 | F6  | ≡    | 1,86 | 1,56 |      |
| 55  | 37  | 8    | 151 | 97  | ü    | 183 | B7  | Ü    | 215 | D7  | ▬    | 247 | F7  | ≡    | 1,87 | 1,57 |      |
| 56  | 38  | 9    | 152 | 98  | ü    | 184 | B8  | Ü    | 216 | D8  | ▬    | 248 | F8  | ≡    | 1,88 | 1,58 |      |
| 57  | 39  | :    | 153 | 99  | ü    | 185 | B9  | Ü    | 217 | D9  | ▬    | 249 | F9  | ≡    | 1,89 | 1,59 |      |
| 58  | 3A  | :    | 154 | 9A  | ü    | 186 | BA  | Ü    | 218 | DA  | ▬    | 250 | FA  | ≡    | 1,90 | 1,5A |      |
| 59  | 3B  | :    | 155 | 9B  | ü    | 187 | BB  | Ü    | 219 | DB  | ▬    | 251 | FB  | ≡    | 1,91 | 1,5B |      |
| 60  | 3C  | :    | 156 | 9C  | ü    | 188 | BC  | Ü    | 220 | DC  | ▬    | 252 | FC  | ≡    | 1,92 | 1,5C |      |
| 61  | 3D  | :    | 157 | 9D  | ü    | 189 | BD  | Ü    | 221 | DD  | ▬    | 253 | FD  | ≡    | 1,93 | 1,5D |      |
| 62  | 3E  | :    | 158 | 9E  | ü    | 190 | BE  | Ü    | 222 | DE  | ▬    | 254 | FE  | ≡    | 1,94 | 1,5E |      |
| 63  | 3F  | :    | 159 | 9F  | ü    | 191 | BF  | Ü    | 223 | DF  | ▬    | 255 | FF  | ≡    | 1,95 | 1,5F |      |



# IBM CHARACTER SET 1 (IN IBM MODE)

| DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR |
|--------------|--------------|--------------|--------------|--------------|--------------|
| 32 20 !      | 64 40 @      | 96 60 ~      | 160 A0       | 192 C0       | 224 E0 α     |
| 33 21 "      | 65 41 A      | 97 61 a      | 161 A1       | 193 C1       | 225 E1 β     |
| 34 22 #      | 66 42 B      | 98 62 b      | 162 A2       | 194 C2       | 226 E2 γ     |
| 35 23 \$     | 67 43 C      | 99 63 c      | 163 A3       | 195 C3       | 227 E3 δ     |
| 36 24 %      | 68 44 D      | 100 64 d     | 164 A4       | 196 C4       | 228 E4 ε     |
| 37 25 &      | 69 45 E      | 101 65 e     | 165 A5       | 197 C5       | 229 E5 ζ     |
| 38 26 ' (    | 70 46 F      | 102 66 f     | 166 A6       | 198 C6       | 230 E6 η     |
| 39 27 )      | 71 47 G      | 103 67 g     | 167 A7       | 199 C7       | 231 E7 θ     |
| 40 28 *      | 72 48 H      | 104 68 h     | 168 A8       | 200 C8       | 232 E8 ι     |
| 41 29 +      | 73 49 I      | 105 69 i     | 169 A9       | 201 C9       | 233 E9 κ     |
| 42 2A ,      | 74 4A J      | 106 6A j     | 170 AA       | 202 CA       | 234 EA λ     |
| 43 2B -      | 75 4B K      | 107 6B k     | 171 AB       | 203 CB       | 235 EB μ     |
| 44 2C .      | 76 4C L      | 108 6C l     | 172 AC       | 204 CC       | 236 EC ν     |
| 45 2D /      | 77 4D M      | 109 6D m     | 173 AD       | 205 CD       | 237 ED ξ     |
| 46 2E 0      | 78 4E N      | 110 6E n     | 174 AE       | 206 CE       | 238 EE ο     |
| 47 2F 1      | 79 4F O      | 111 6F o     | 175 AF       | 207 CF       | 239 EF π     |
| 48 30 2      | 80 50 P      | 112 70 p     | 176 B0       | 208 D0       | 240 F0 ρ     |
| 49 31 3      | 81 51 Q      | 113 71 q     | 177 B1       | 209 D1       | 241 F1 σ     |
| 50 32 4      | 82 52 R      | 114 72 r     | 178 B2       | 210 D2       | 242 F2 τ     |
| 51 33 5      | 83 53 S      | 115 73 s     | 179 B3       | 211 D3       | 243 F3 υ     |
| 52 34 6      | 84 54 T      | 116 74 t     | 180 B4       | 212 D4       | 244 F4 φ     |
| 53 35 7      | 85 55 U      | 117 75 u     | 181 B5       | 213 D5       | 245 F5 χ     |
| 54 36 8      | 86 56 V      | 118 76 v     | 182 B6       | 214 D6       | 246 F6 ψ     |
| 55 37 9      | 87 57 W      | 119 77 w     | 183 B7       | 215 D7       | 247 F7 ω     |
| 56 38 :      | 88 58 X      | 120 78 x     | 184 B8       | 216 D8       | 248 F8 Ω     |
| 57 39 ;      | 89 59 Y      | 121 79 y     | 185 B9       | 217 D9       | 249 FA ϖ     |
| 58 3A <      | 90 5A Z      | 122 7A z     | 186 BA       | 218 DA       | 250 FA ϗ     |
| 59 3B =      | 91 5B [      | 123 7B {     | 187 BB       | 219 DB       | 251 FB ϙ     |
| 60 3C >      | 92 5C \      | 124 7C }     | 188 BC       | 220 DC       | 252 FC Ϛ     |
| 61 3D ?      | 93 5D ]      | 125 7D ~     | 189 BD       | 221 DD       | 253 FD ϛ     |
| 62 3E        | 94 5E ^      | 126 7E ~     | 190 BE       | 222 DE       | 254 FE Ϝ     |
| 63 3F        | 95 5F _      | 127 7F       | 191 BF       | 223 DF       | 255 FF ϝ     |

Note : When U.S.A. font is selected.

## IBM CHARACTER SET 2 (IN IBM MODE)

[illegible]

Note : When U.S.A. font is selected.



# EPSON CHARACTER SET (IN EPSON MODE)

| DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR |
|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|
| 32  | 20  | !    | 64  | 40  | Q    | 96  | 60  | `    | 160 | A0  |      | 192 | C0  | Ø    | 224 | E0  | `    |
| 33  | 21  | "    | 65  | 41  | A    | 97  | 61  | a    | 161 | A1  | !    | 193 | C1  | A    | 225 | E1  | a    |
| 34  | 22  | #    | 66  | 42  | B    | 98  | 62  | b    | 162 | A2  | "    | 194 | C2  | B    | 226 | E2  | b    |
| 35  | 23  | \$   | 67  | 43  | C    | 99  | 63  | c    | 163 | A3  | #    | 195 | C3  | C    | 227 | E3  | c    |
| 36  | 24  | %    | 68  | 44  | D    | 100 | 64  | d    | 164 | A4  | \$   | 196 | C4  | D    | 228 | E4  | d    |
| 37  | 25  | &    | 69  | 45  | E    | 101 | 65  | e    | 165 | A5  | %    | 197 | C5  | E    | 229 | E5  | e    |
| 38  | 26  | -    | 70  | 46  | F    | 102 | 66  | f    | 166 | A6  | &    | 198 | C6  | F    | 230 | E6  | f    |
| 39  | 27  | (    | 71  | 47  | G    | 103 | 67  | g    | 167 | A7  | -    | 199 | C7  | G    | 231 | E7  | g    |
| 40  | 28  | )    | 72  | 48  | H    | 104 | 68  | h    | 168 | A8  | (    | 200 | C8  | H    | 232 | E8  | h    |
| 41  | 29  | *    | 73  | 49  | I    | 105 | 69  | i    | 169 | A9  | )    | 201 | C9  | I    | 233 | E9  | i    |
| 42  | 2A  | +    | 74  | 4A  | J    | 106 | 6A  | j    | 170 | AA  | *    | 202 | CA  | J    | 234 | EA  | j    |
| 43  | 2B  | ,    | 75  | 4B  | K    | 107 | 6B  | k    | 171 | AB  | +    | 203 | CB  | K    | 235 | EB  | k    |
| 44  | 2C  | -    | 76  | 4C  | L    | 108 | 6C  | l    | 172 | AC  | ,    | 204 | CC  | L    | 236 | EC  | l    |
| 45  | 2D  | .    | 77  | 4D  | M    | 109 | 6D  | m    | 173 | AD  | -    | 205 | CD  | M    | 237 | ED  | m    |
| 46  | 2E  | /    | 78  | 4E  | N    | 110 | 6E  | n    | 174 | AE  | .    | 206 | CE  | N    | 238 | EE  | n    |
| 47  | 2F  | 0    | 79  | 4F  | O    | 111 | 6F  | o    | 175 | AF  | /    | 207 | CF  | O    | 239 | EF  | o    |
| 48  | 30  | 1    | 80  | 50  | P    | 112 | 70  | p    | 176 | B0  | 0    | 208 | D0  | P    | 240 | F0  | p    |
| 49  | 31  | 2    | 81  | 51  | Q    | 113 | 71  | q    | 177 | B1  | 1    | 209 | D1  | Q    | 241 | F1  | q    |
| 50  | 32  | 3    | 82  | 52  | R    | 114 | 72  | r    | 178 | B2  | 2    | 210 | D2  | R    | 242 | F2  | r    |
| 51  | 33  | 4    | 83  | 53  | S    | 115 | 73  | s    | 179 | B3  | 3    | 211 | D3  | S    | 243 | F3  | s    |
| 52  | 34  | 5    | 84  | 54  | T    | 116 | 74  | t    | 180 | B4  | 4    | 212 | D4  | T    | 244 | F4  | t    |
| 53  | 35  | 6    | 85  | 55  | U    | 117 | 75  | u    | 181 | B5  | 5    | 213 | D5  | U    | 245 | F5  | u    |
| 54  | 36  | 7    | 86  | 56  | V    | 118 | 76  | v    | 182 | B6  | 6    | 214 | D6  | V    | 246 | F6  | v    |
| 55  | 37  | 8    | 87  | 57  | W    | 119 | 77  | w    | 183 | B7  | 7    | 215 | D7  | W    | 247 | F7  | w    |
| 56  | 38  | 9    | 88  | 58  | X    | 120 | 78  | x    | 184 | B8  | 8    | 216 | D8  | X    | 248 | F8  | x    |
| 57  | 39  | :    | 89  | 59  | Y    | 121 | 79  | y    | 185 | B9  | 9    | 217 | D9  | Y    | 249 | F9  | y    |
| 58  | 3A  | ;    | 90  | 5A  | Z    | 122 | 7A  | z    | 186 | BA  | :    | 218 | DA  | Z    | 250 | FA  | z    |
| 59  | 3B  | <    | 91  | 5B  | [    | 123 | 7B  | {    | 187 | BB  | ;    | 219 | DB  | [    | 251 | FB  | {    |
| 60  | 3C  | =    | 92  | 5C  | \    | 124 | 7C  | !    | 188 | BC  | <    | 220 | DC  | \    | 252 | FC  | !    |
| 61  | 3D  | >    | 93  | 5D  | ]    | 125 | 7D  | }    | 189 | BD  | =    | 221 | DD  | }    | 253 | FD  | }    |
| 62  | 3E  | ~    | 94  | 5E  | ^    | 126 | 7E  | ~    | 190 | BE  | >    | 222 | DE  | ^    | 254 | FE  | ~    |
| 63  | 3F  | ?    | 95  | 5F  | -    | 127 | 7F  | ?    | 191 | BF  | ?    | 223 | DF  | -    | 255 | FF  | ?    |

Note : When U.S.A. font is selected.

# PRESTEL CHARACTER SET (IN PRESTEL MODE)

| DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR | DEC HEX CHAR |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 32 20        | 53 35        | 74 4A        | 95 5F        | 116 74       | 169 A9       | 190 BE       | 211 D3       |
| 33 21 !      | 54 36 6      | 75 4B K      | 96 60 -      | 117 75 u     | 170 AA       | 191 BF       | 212 D4       |
| 34 22 "      | 55 37 7      | 76 4C L      | 97 61 a      | 118 76 v     | 171 AB       | 192 C0       | 213 D5       |
| 35 23 £      | 56 38 8      | 77 4D M      | 98 62 b      | 119 77 w     | 172 AC       | 193 C1       | 214 D6       |
| 36 24 \$     | 57 39 9      | 78 4E N      | 99 63 c      | 120 78 x     | 173 AD       | 194 C2       | 215 D7       |
| 37 25 %      | 58 3A :      | 79 4F O      | 100 64 d     | 121 79 y     | 174 AE       | 195 C3       | 216 D8       |
| 38 26 &      | 59 3B ;      | 80 50 P      | 101 65 e     | 122 7A z     | 175 AF       | 196 C4       | 217 D9       |
| 39 27 ,      | 60 3C <      | 81 51 Q      | 102 66 f     | 123 7B ¤     | 176 B0       | 197 C5       | 218 DA       |
| 40 28 (      | 61 3D =      | 82 52 R      | 103 67 g     | 124 7C "     | 177 B1       | 198 C6       | 219 DB       |
| 41 29 )      | 62 3E >      | 83 53 S      | 104 68 h     | 125 7D ¤     | 178 B2       | 199 C7       | 220 DC       |
| 42 2A *      | 63 3F ?      | 84 54 T      | 105 69 i     | 126 7E ÷     | 179 B3       | 200 C8       | 221 DD       |
| 43 2B +      | 64 40 @      | 85 55 U      | 106 6A j     | 127 7F ■     | 180 B4       | 201 C9       | 222 DE       |
| 44 2C ,      | 65 41 A      | 86 56 V      | 107 6B k     | 160 A0       | 181 B5       | 202 CA       | 223 DF       |
| 45 2D -      | 66 42 B      | 87 57 W      | 108 6C l     | 161 A1 ■     | 182 B6       | 203 CB       |              |
| 46 2E .      | 67 43 C      | 88 58 X      | 109 6D m     | 162 A2 ■     | 183 B7       | 204 CC       |              |
| 47 2F /      | 68 44 D      | 89 59 Y      | 110 6E n     | 163 A3 ■     | 184 B8       | 205 CD       |              |
| 48 30 0      | 69 45 E      | 90 5A Z      | 111 6F o     | 164 A4 ■     | 185 B9       | 206 CE       |              |
| 49 31 1      | 70 46 F      | 91 5B ←      | 112 70 p     | 165 A5 ■     | 186 BA       | 207 CF       |              |
| 50 32 2      | 71 47 G      | 92 5C ¤      | 113 71 q     | 166 A6       | 187 BB       | 208 D0       |              |
| 51 33 3      | 72 48 H      | 93 5D →      | 114 72 r     | 167 A7       | 188 BC       | 209 D1       |              |
| 52 34 4      | 73 49 I      | 94 5E ↑      | 115 73 s     | 168 A8 ■     | 189 BD       | 210 D2       |              |

Note : When U.K. font is selected.



# APPENDIX D CONTROL CODE SUMMARIES

## MSX MODE

| CATEGORY                  | ITEM | ASCII   | DECIMAL   | HEXADECIMAL | FUNCTION                                     |
|---------------------------|------|---------|-----------|-------------|----------------------------------------------|
| PRINT COMMANDS            | 1    | CR      | 13        | 0D          | Carriage return after printing               |
|                           | 2    | LF      | 10        | 0A          | Linefeed after printing                      |
|                           | 3    | VT      | 11        | 0B          | Linefeed to next vertical tab after printing |
|                           | 4    | FF      | 12        | 0C          | Form feed after printing                     |
| CHARACTER PITCH SELECTION | 5    | ESC N   | 27 78     | 1B 4E       | Select pica character mode                   |
|                           | 6    | ESC E   | 27 69     | 1B 45       | Select Elite character mode                  |
|                           | 7    | ESC Q   | 27 81     | 1B 51       | Select Condensed Pica character mode         |
|                           | 8    | ESC P   | 27 80     | 1B 50       | Select Proportional character mode           |
| DOUBLE-WIDTH PRINTING     | 9    | SO      | 14        | 0E          | Select Double-width print function           |
|                           | 10   | SI      | 15        | 0F          | Cancel Double-width print function           |
| LETTER-QUALITY PRINTING   | 11   | ESC !   | 27 33     | 1B 21       | Select Letter-quality print function         |
|                           | 12   | ESC "   | 27 34     | 1B 22       | Cancel Letter-quality print function         |
| SUPER/SUBSCRIPT PRINTING  | 13   | ESC C S | 27 67 83  | 1B 43 53    | Select Superscript print function            |
|                           | 14   | ESC C s | 27 67 115 | 1B 43 73    | Cancel Superscript print function            |
|                           | 15   | ESC C U | 27 67 85  | 1B 43 55    | Select Subscript print function              |
|                           | 16   | ESC C u | 27 67 117 | 1B 43 75    | Cancel Subscript print function              |
| ITALIC PRINTING           | 17   | ESC C I | 27 67 73  | 1B 43 49    | Select Italic print function                 |
|                           | 18   | ESC C i | 27 67 105 | 1B 43 69    | Cancel Italic print function                 |

| CATEGORY                    | ITEM | ASCII           | DECIMAL          | HEXADECIMAL      | FUNCTION                            |
|-----------------------------|------|-----------------|------------------|------------------|-------------------------------------|
| BOLD PRINTING               | 19   | ESC C B         | 27 67 66         | 1B 43 42         | Select Bold print function          |
|                             | 20   | ESC C b         | 27 67 98         | 1B 43 62         | Cancel Bold print function          |
| DOUBLE-STRIKE PRINT-<br>ING | 21   | ESC C D         | 27 67 68         | 1B 43 44         | Select Double-strike print function |
|                             | 22   | ESC C d         | 27 67 100        | 1B 43 64         | Cancel Double-strike print function |
| HORIZONTAL TAB              | 23   | HT              | 09               | 09               | Move to next horizontal tab         |
|                             | 24   | ESC ( nnn , ... | 27 40 nnn 44 ... | 1B 28 nnn 2C ... | Set horizontal tab stops            |
|                             | 25   | ESC ) nnn , ... | 27 41 nnn 44 ... | 1B 29 nnn 2C ... | Cancel horizontal tab stops         |
|                             | 26   | ESC 2           | 27 50            | 1B 32            | Cancel all horizontal tab stops     |
|                             |      |                 |                  |                  |                                     |
| PAGE LENGTH                 | 27   | ESC O nnn       | 27 79 nnn        | 1B 4F nnn        | Set page length in lines            |
|                             | 28   | ESC O l nn      | 27 79 73 nn      | 1B 4F 49 nn      | Set page length in inches           |
| PERFORATION SKIP            | 29   | ESC O S nn      | 27 79 83 nn      | 1B 4F 53 nn      | Set perforation skip of nn lines    |
|                             | 30   | ESC O S 00      | 27 79 83 48 48   | 1B 4F 53 30 30   | Cancel perforation skip             |
| MARGIN SETTING              | 31   | ESC / nnn       | 27 47 nnn        | 1B 2F nnn        | Set right margin                    |
|                             | 32   | ESC L nnn       | 27 76 nnn        | 1B 4C nnn        | Set left margin                     |
| LINEFEED SPACING            | 33   | ESC A           | 27 65            | 1B 41            | Set linefeed to 1/6 inch            |
|                             | 34   | ESC B           | 27 66            | 1B 42            | Set linefeed to 1/9 inch            |
|                             | 35   | ESC T nn        | 27 54 nn         | 1B 54 nn         | Set linefeed of nn/144 inch         |
|                             | 36   | ESC Z nn        | 27 90 nn         | 1B 5A nn         | Set linefeed of nn/216 inch         |
| PRINTING DIRECTION          | 37   | ESC [           | 27 91            | 1B 5B            | Select uni-directional printing     |
|                             | 38   | ESC ]           | 27 93            | 1B 5D            | Select bi-directional printing      |
| PAPER-OUT DETECTION         | 39   | ESC q           | 27 113           | 1B 71            | Disable paper-out detection         |
|                             | 40   | ESC p           | 27 112           | 1B 70            | Enable paper-out detection          |
| HOME POSITIONING            | 41   | ESC CR          | 27 13            | 1B 0D            | Move print head to home position    |



| CATEGORY                | ITEM | ASCII     | DECIMAL   | HEXADECIMAL | FUNCTION                                              |
|-------------------------|------|-----------|-----------|-------------|-------------------------------------------------------|
| RESET                   | 42   | ESC @     | 27 64     | 1B 40       | Reset (initialise printer), or return to PRESTEL mode |
|                         | 43   | BEL       | 07        | 07          | Sound buzzer                                          |
| BUFFER CLEAR            | 44   | CAN       | 24        | 18          | Clear internal buffer                                 |
| GRAPHIC PRINTING        | 45   | ESC G ... | 27 71 ... | 1B 47 ...   | Print graphic data at specified density               |
|                         | 46   | ESC S ... | 27 83 ... | 1B 53 ...   | Print graphic data at current print pitch             |
| SPECIAL SYMBOL          | 47   | SOH n     | 01 n      | 01 n        | Print special graphic symbol                          |
| UNDERLINE FUNCTION      | 48   | ESC X     | 27 88     | 1B 58       | Select underline function                             |
|                         | 49   | ESC Y     | 27 89     | 1B 59       | Cancel underline function                             |
| BACKSPACE               | 50   | BS        | 08        | 08          | After printing, move one character space to the left  |
| CHARACTER SET SELECTION | 51   | ESC \$    | 27 36     | 1B 24       | Select MSX character set (default)                    |
|                         | 52   | ESC &     | 27 38     | 1B 26       | Select PRESTEL character set                          |

# IBM, EPSON, AND PRESTEL MODES

(o : Valid, - : Invalid)

| CATEGORY                           | ITEM | ASCII   | DECIMAL   | HEXADECIMAL | FUNCTION                                                              | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|------------------------------------|------|---------|-----------|-------------|-----------------------------------------------------------------------|-------------|---------------|-----------------|
| PRINT COM-<br>MANDS                | 1    | CR      | 13        | 0D          | Carriage return or carriage<br>return plus linefeed after<br>printing | o           | o             | o               |
|                                    | 2    | LF      | 10        | 0A          | Linefeed plus carriage<br>return after printing                       | o           | o             | o               |
|                                    | 3    | FF      | 12        | 0C          | Form feed after printing                                              | o           | o             | o               |
|                                    | 4    | VT      | 11        | 0B          | Linefeed to next vertical<br>tab after printing                       | o           | o             | o               |
|                                    | 5    | ESC J n | 27 74 n   | 1B 4A n     | n/144 or n/216 inch<br>linefeed after printing                        | o           | o             | -               |
|                                    | 6    | ESC j n | 27 106 n  | 1B 6A n     | n/144 or n/216 inch reverse<br>linefeed after printing                | o           | o             | -               |
| CHARACTER<br>MODE DESIGNA-<br>TION | 7    | ESC P   | 27 80     | 1B 50       | Cancel Elite (12 cpi)                                                 | o           | o             | o               |
|                                    | 8    | ESC M   | 27 77     | 1B 4D       | Select Elite (12 cpi)                                                 | o           | o             | o               |
|                                    | 9    | SI      | 15        | 0F          | Select Condensed character<br>pitch                                   | o           | o             | o               |
|                                    | 10   | ESC SI  | 27 15     | 1B 0F       | Same as SI command                                                    | o           | o             | o               |
|                                    | 11   | DC2     | 18        | 12          | Cancel Condensed mode<br>started by SI or ESC SI                      | o           | o             | o               |
|                                    | 12   | ESC x 1 | 27 120 49 | 1B 78 31    | Select Letter-quality print<br>mode                                   | o           | o             | o               |
|                                    | 13   | ESC x 0 | 27 120 48 | 1B 78 30    | Cancel Letter-quality print<br>mode                                   | o           | o             | o               |
|                                    | 14   | ESC p 1 | 27 112 49 | 1B 70 31    | Select Proportional charac-<br>ter pitch                              | o           | o             | o               |
|                                    | 15   | ESC p 0 | 27 112 48 | 1B 70 30    | Cancel Proportional charac-<br>ter pitch                              | o           | o             | o               |



(o : Valid, - : Invalid)

| CATEGORY                         | ITEM | ASCII           | DECIMAL         | HEXADECIMAL     | FUNCTION                                           | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|----------------------------------|------|-----------------|-----------------|-----------------|----------------------------------------------------|-------------|---------------|-----------------|
| CHARACTER<br>MODE<br>DESIGNATION | 16   | ESC S 0         | 27 83 49        | 1B 53 30        | Select Superscript                                 | o           | o             | o               |
|                                  | 7    | ESC S 1         | 27 83 48        | 1B 53 31        | Select Subscript                                   | o           | o             | o               |
|                                  | 18   | ESC T           | 27 84           | 1B 54           | Cancel Super- / Subscript                          | o           | o             | o               |
|                                  | 19   | ESC 4           | 27 52           | 1B 34           | Select Italics                                     | -           | o             | o               |
|                                  | 20   | ESC 5           | 27 53           | 1B 35           | Cancel Italics                                     | -           | o             | o               |
|                                  | 21   | ESC ! n         | 27 33 n         | 1B 21 n         | Select mixed print modes                           | o           | o             | o               |
| BOLD PRINTING                    | 22   | ESC E           | 27 69           | 1B 45           | Select Bold (Emphasised)                           | o           | o             | o               |
|                                  | 23   | ESC F           | 27 70           | 1B 46           | Cancel Bold (Emphasised)                           | o           | o             | o               |
| DOUBLE-<br>STRIKE PRINT-<br>ING  | 24   | ESC G           | 27 71           | 1B 47           | Select Double-strike print-<br>ing                 | o           | o             | o               |
|                                  | 25   | ESC H           | 27 72           | 1B 48           | Cancel Double-strike print-<br>ing                 | o           | o             | o               |
| DOUBLE-WIDTH<br>PRINTING         | 26   | SO              | 14              | 0E              | Select Double-width print-<br>ing for current line | o           | o             | o               |
|                                  | 27   | ESC SO          | 27 14           | 1B 0E           | Same as SO command                                 | o           | o             | o               |
|                                  | 28   | DC4             | 20              | 14              | Cancel Double-width print-<br>ing                  | o           | o             | o               |
|                                  | 29   | ESC W 1         | 27 87 49        | 1B 57 31        | Select Double-width print-<br>ing                  | o           | o             | o               |
|                                  | 30   | ESC W 0         | 27 87 48        | 1B 57 30        | Cancel Double-width print-<br>ing                  | o           | o             | o               |
|                                  |      |                 |                 |                 |                                                    |             |               |                 |
| GRAPHIC MODE                     | 31   | ESC K n1 n2 ... | 27 75 n1 n2 ... | 1B 4B n1 n2 ... | Print standard-density<br>graphics                 | o           | o             | o               |
|                                  | 32   | ESC L n1 n2 ... | 27 76 n1 n2 ... | 1B 4C n1 n2 ... | Print double-density<br>graphics                   | o           | o             | o               |
|                                  | 33   | ESC Y n1 n2 ... | 27 89 n1 n2 ... | 1B 59 n1 n2 ... | Print double-speed double-<br>density graphics     | o           | o             | o               |

(○ : Valid, - : Invalid)

| CATEGORY       | ITEM | ASCII              | DECIMAL            | HEXADECIMAL        | FUNCTION                                                        | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|----------------|------|--------------------|--------------------|--------------------|-----------------------------------------------------------------|-------------|---------------|-----------------|
| GRAPHIC MODE   | 34   | ESC Z n l n2 ...   | 27 90 n l n2 ...   | 1B 5A n l n2 ...   | Print quadruple-density graphics                                | ○           | ○             | ○               |
|                | 35   | ESC * m n l n2 ... | 27 42 m n l n2 ... | 1B 2A m n l n2 ... | Print graphics at specified density                             | ○           | ○             | ○               |
|                | 36   | ESC ^ m n l n2 ... | 27 94 m n l n2 ... | 1B 5E m n l n2 ... | Print 9-pin graphics                                            | ○           | ○             | ○               |
|                | 37   | ESC ? n m          | 27 63 n m          | 1B 3F n m          | Re-assign graphic commands                                      | ○           | ○             | ○               |
| LINEFEED PITCH | 38   | ESC 0              | 27 48              | 1B 30              | Set linefeed pitch to 1/8 inch                                  | ○           | ○             | -               |
|                | 39   | ESC 1              | 27 49              | 1B 31              | Set linefeed pitch to 7/72 inch                                 | ○           | ○             | -               |
|                | 40   | ESC 2              | 27 50              | 1B 32              | Set linefeed pitch to 1/6 inch                                  | -           | ○             | -               |
|                |      |                    |                    |                    | Perform linefeed set by ESC A n command                         | ○           | -             | -               |
|                | 41   | ESC 3 n            | 27 51 n            | 1B 33 n            | Set linefeed pitch to n/144 or n/216 inch                       | ○           | ○             | -               |
|                | 42   | ESC A n            | 27 65 n            | 1B 41 n            | Set linefeed pitch to n/72 inch                                 | -           | ○             | -               |
|                |      |                    |                    |                    | Set linefeed pitch for ESC 2 command                            | ○           | -             | -               |
|                | 43   | GS 1               | 29 1               | 1D 01              | Set n/144 inch units for ESC 3 n, ESC J n, and ESC j n commands | ○           | ○             | -               |
| PAGE LENGTH    | 44   | GS 0               | 29 0               | 1D 00              | Set n/216 inch units for ESC 3 n, ESC J n, and ESC j n commands | ○           | ○             | -               |
|                | 45   | ESCC n             | 29 67 n            | 1B 43 n            | Set page length to n lines                                      | ○           | ○             | ○               |
|                | 46   | ESCC 0 n           | 27 67 0 n          | 1B 43 00 n         | Set page length to n inches                                     | ○           | ○             | ○               |



(o : Valid, - : Invalid)

| CATEGORY               | ITEM | ASCII                 | DECIMAL                | HEXADECIMAL     | FUNCTION                                                 | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|------------------------|------|-----------------------|------------------------|-----------------|----------------------------------------------------------|-------------|---------------|-----------------|
| HORIZONTAL<br>TABS     | 47   | ESCD n1 n2 ...<br>NUL | 27 68 n1 n2 ...<br>NUL | 1B 44 n1 n2 ... | NUL Set horizontal tab stops                             | o           | o             | o               |
|                        | 48   | HT                    | 9                      | 09              | Move to next horizontal tab<br>stop                      | o           | o             | o               |
| MARGIN SET-<br>TING    | 49   | ESC Q n               | 27 81 n                | 1B 51 n         | Set right margin in column                               | o           | o             | o               |
|                        | 50   | ESC I n               | 27 108 n               | 1B 6C n         | Set left margin in column                                | o           | o             | o               |
|                        | 51   | ESC X n1 n2           | 27 88 n1 n2            | 1B 58 n1 n2     | Set left margin in column,<br>and right margin in column | o           | o             | o               |
| UNDERLINE<br>FUNCTION  | 52   | ESC - 1               | 27 45 49               | 1B 2D 31        | Select underline function                                | o           | o             | o               |
|                        | 53   | ESC - 0               | 27 45 48               | 1B 2D 30        | Cancel underline function                                | o           | o             | o               |
| BUFFER CLEAR           | 54   | CAN                   | 24                     | 18              | Clear internal buffer                                    | o           | o             | o               |
| BACKSPACE              | 55   | BS                    | 8                      | 08              | After printing, move one<br>character space to the left  | o           | o             | o               |
| BUZZER                 | 56   | BEL                   | 7                      | 07              | Sound buzzer                                             | o           | o             | o               |
| HOME<br>POSITIONING    | 57   | ESC <                 | 27 60                  | 1B 3C           | Move print head to home<br>position                      | o           | o             | o               |
| PERFORATION<br>SKIP    | 58   | ESC N n               | 27 78 n                | 1B 4E n         | Set perforation skip of n<br>lines                       | o           | o             | o               |
|                        | 59   | ESCO                  | 27 79                  | 1B 4F           | Cancel perforation skip                                  | o           | o             | o               |
| PAPER-OUT<br>DETECTION | 60   | ESC 8                 | 27 56                  | 1B 38           | Disable paper-out detection<br>function                  | o           | o             | o               |
|                        | 61   | ESC 9                 | 27 57                  | 1B 39           | Enable paper-out detection<br>function                   | o           | o             | o               |
| RESET                  | 62   | ESC @                 | 27 64                  | 1B 40           | Initialise printer or return to<br>PRESTEL mode          | o           | o             | o               |

(o : Valid, - : Invalid)

| CATEGORY                    | ITEM | ASCII                    | DECIMAL                  | HEXADECIMAL              | FUNCTION                                          | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|-----------------------------|------|--------------------------|--------------------------|--------------------------|---------------------------------------------------|-------------|---------------|-----------------|
| PRINTING DIRECTION          | 63   | ESC U 1                  | 27 85 49                 | 1B 55 31                 | Select uni-directional printing                   | o           | o             | o               |
|                             | 64   | ESC U 0                  | 27 85 48                 | 1B 55 30                 | Select bi-directional printing                    | o           | o             | o               |
| INTERNATIONAL CHARACTER SET | 65   | ESC R n                  | 27 82 n                  | 1B 52 n                  | Select international character set                | -           | o             | o               |
|                             | 66   | ESC R n                  | 27 82 n                  | 1B 52 n                  | Select mode specified by n (IBM, EPSON, or MSX)   | -           | -             | o               |
| TAB INITIALISATION          | 67   | ESC R                    | 27 82                    | 1B 52                    | Restore default tab settings                      | o           | -             | -               |
| DELETE CHARACTER            | 68   | DEL                      | 127 or 255               | 7F or FF                 | Delete preceding character                        | o           | o             | o               |
| VERTICAL TAB                | 69   | ESC B n1 n2 ...<br>NUL   | 27 66 n1 n2 ...<br>NUL   | 1B 42 n1 n2 ...<br>NUL   | Set vertical tabs (in channel 0)                  | o           | o             | o               |
|                             | 70   | ESC b m n1 n2 ...<br>NUL | 27 98 m n1 n2 ...<br>NUL | 1B 62 m n1 n2 ...<br>NUL | Set vertical tabs (in channel m)                  | -           | o             | o               |
|                             | 71   | ESC / m                  | 27 47 m                  | 1B 2F m                  | Select tab channel m                              | -           | o             | o               |
| PRINTER SELECTION           | 72   | DC3                      | 19                       | 13                       | De-select printer                                 | o           | o             | o               |
|                             | 73   | DC1                      | 17                       | 11                       | Select printer                                    | o           | o             | o               |
| DOWNLOAD CHARACTER          | 74   | ESC % 0 0                | 27 37 0 0                | 1B 25 00 00              | Select normal ROM character set                   | -           | o             | o               |
|                             | 75   | ESC % 1 0                | 27 37 1 0                | 1B 25 01 00              | Select RAM character set                          | -           | o             | o               |
|                             | 76   | ESC : 0 0 0              | 27 58 0 0 0              | 1B 3A 00 00 00           | Copy RAM characters from normal ROM character set | -           | o             | o               |
|                             | 77   | ESC & 0 n m ...          | 27 38 0 n m ...          | 1B 26 00 n m ...         | Define download characters                        | -           | o             | o               |



(o: Valid, -: Invalid)

| TEGORY                              | ITEM | ASCII        | DECIMAL     | HEXADECIMAL | FUNCTION                                           | IBM<br>MODE | EPSON<br>MODE | PRESTEL<br>MODE |
|-------------------------------------|------|--------------|-------------|-------------|----------------------------------------------------|-------------|---------------|-----------------|
| INPUT DATA<br>CONTROL               | 78   | ESC =        | 27 61       | 1B 3D       | Set MSB to 0                                       | -           | o             | o               |
|                                     | 79   | ESC >        | 27 62       | 1B 3E       | Set MSB to 1                                       | -           | o             | o               |
|                                     | 80   | ESC #        | 27 35       | 1B 23       | Cancel input data control                          | -           | o             | o               |
|                                     | 81   | ESC 6        | 27 54       | 1B 36       | Print italics for decimal<br>codes 128-159 and 255 | -           | o             | -               |
| PRINT CODE<br>AREA DESIGNA-<br>TION | 82   | ESC 7        | 27 55       | 1B 37       | Select IBM character set 2                         | o           | -             | -               |
|                                     | 83   | ESC i 1      | 27 73 49    | 1B 49 31    | Cancel ESC 6                                       | -           | o             | -               |
|                                     | 84   | ESC i 0      | 27 73 48    | 1B 49 30    | Select IBM character set 1                         | o           | -             | -               |
|                                     | 85   | ESC i 1      | 27 105 49   | 1B 69 31    | Assign print characters to<br>control code area    | o           | o             | -               |
| IMMEDIATE<br>PRINTING               | 86   | ESC i 0      | 27 105 48   | 1B 69 30    | Cancel ESC i 1                                     | o           | o             | o               |
|                                     | 87   | ESC EM 4     | 27 25 52    | 1B 19 34    | Select immediate print<br>mode                     | o           | o             | o               |
|                                     | 88   | ESC EM 0     | 27 25 48    | 1B 19 30    | Cancel immediate print<br>mode                     | o           | o             | o               |
|                                     | 89   | ESC EM R     | 27 25 82    | 1B 19 52    | Select CSF mode                                    | o           | o             | o               |
| CSF CONTROL                         | 90   | ESC 51       | 27 53 49    | 1B 35 31    | Cancel CSF mode                                    | o           | -             | -               |
|                                     | 91   | ESC 50       | 27 53 48    | 1B 35 30    | Eject cut sheet                                    | o           | -             | -               |
|                                     | 92   | ESC SP n     | 27 32 n     | 1B 20 n     | CR command = CR + LF                               | o           | o             | o               |
|                                     | 93   | ESC \$ n1 n2 | 27 36 n1 n2 | 1B 24 n1 n2 | CR command = CR only                               | o           | o             | o               |
| CR CODE CON-<br>TROL                | 94   | ESC SP n     | 27 32 n     | 1B 20 n     | Insert n dots between<br>characters                | o           | o             | o               |
|                                     | 95   | ESC SP n     | 27 32 n     | 1B 20 n     | Move print head to ab-<br>solute position          | o           | o             | o               |
|                                     | 96   | ESC \$ n1 n2 | 27 36 n1 n2 | 1B 24 n1 n2 | Move print head to relative<br>position            | o           | o             | o               |
|                                     | 97   | ESC \$ n1 n2 | 27 36 n1 n2 | 1B 24 n1 n2 | Move print head to relative<br>position            | o           | o             | o               |

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